

```

/*****
/**                               DISLIN.H                               **/
/**                               **/
/** INCLUDE file for DISLIN C routines.                               **/
/**                               **/
/** Date       : 15.01.2014                                           **/
/** Functions: 767                                                    **/
/** Version   : 10.4 / Double Precision                               **/
*****/

```

```

#ifndef _DISLIN_H_
#define _DISLIN_H_

```

```

/* Defines for symbols */

```

```

#define SYMBOL_EMPTY           -1
#define SYMBOL_SQUARE         0
#define SYMBOL_OCTAGON        1
#define SYMBOL_TRIANGLE_UP    2
#define SYMBOL_PLUS           3
#define SYMBOL_CROSS          4
#define SYMBOL_DIAMOND        5
#define SYMBOL_TRIANGLE_DOWN   6
#define SYMBOL_SQUARECROSS    7
#define SYMBOL_STAR           8
#define SYMBOL_DIAMONDPLUS    9
#define SYMBOL_OCTAGONPLUS   10
#define SYMBOL_DOUBLETRIANGLE 11
#define SYMBOL_SQUAREPLUS    12
#define SYMBOL_OCTAGONCROSS  13
#define SYMBOL_SQUARETRIANGLE 14
#define SYMBOL_CIRCLE        15
#define SYMBOL_SQUARE_FILLED  16
#define SYMBOL_OCTAGON_FILLED 17
#define SYMBOL_TRIANGLE_UP_FILLED 18
#define SYMBOL_DIAMOND_FILLED 19
#define SYMBOL_TRIANGLE_DOWN_FILLED 20
#define SYMBOL_CIRCLE_FILLED  21
#define SYMBOL_DOT           21
#define SYMBOL_HALFCIRCLE    22
#define SYMBOL_HALFCIRCLE_FILLED 23

```

```

/* Defines for line styles */

```

```

#define LINE_NONE             -1
#define LINE_SOLID           0
#define LINE_DOT             1
#define LINE_DASH            2
#define LINE_CHNDOT         3
#define LINE_DASHM          4
#define LINE_DASHL          5
#define LINE_DOTL           6

```

```

/* Defines for shading patterns */

```

```

#define SHADING_NONE         -1
#define SHADING_EMPTY       0
#define SHADING_LINES       1
#define SHADING_LINES_BOLD  4
#define SHADING_GRID        10
#define SHADING_GRID_BOLD   14
#define SHADING_FILLED      16
#define SHADING_DOTS        17

```

```

#ifdef __cplusplus
extern "C" {
#endif

```

```

void abs3pt (double x, double y, double z, double *xp, double *yp);
void addlab (const char *cstr, double v, int itic, const char *cax);
void angle (int ngrad);
void arcell (int nx, int ny, int na, int nb, double a, double b, double t);
void areaf (const int *nxray, const int *nyray, int n);
void autres (int ixdim, int iydim);
void ax2grf (void);
void ax3len (int nxl, int nyl, int nzl);
void axclrs (int nclr, const char *copt, const char *cax);
void axends (const char *cstr, const char *cax);
void axgit (void);
void axis3d (double x3, double y3, double z3);
void axsbgd (int nclr);
void axslen (int nxl, int nyl);
void axsorg (int nxa, int nya);
void axspos (int nxa, int nya);
void axsscl (const char *cscl, const char *cax);
void axstyp (const char *copt);
void barbor (int iclr);
void barclr (int ic1, int ic2, int ic3);
void bargrp (int ngrp, double gap);
void barmod (const char *cmod, const char *copt);
void baropt (double xf, double a);
void barpos (const char *copt);
void bars (double *xray, double *ylray, double *y2ray, int n);
void bars3d (const double *xray, const double *yray, const double *z1ray,
             const double *z2ray, const double *xwray, const double *ywray,
             const int *icray, int n);

void bartyp (const char *ctyp);
void barwth (double factor);
void basalf (const char *calph);
void basdat (int id, int im, int iy);
void bezier (const double *xray, const double *yray, int nray,
             double *x, double *y, int n);

void bfcclr (int ic);
void bfcmsb (int ic);
short bitsi2 (int nbits, short mher, int iher, short mhin, int ihin);
int bitsi4 (int nbits, int mher, int iher, int mhin, int ihin);
void bmpfnt (const char *copt);
void bmpmod (int n, const char *cval, const char *copt);
void box2d (void);
void box3d (void);
void bufmod (const char *cmod, const char *ckey);
void center (void);
void cgmbgd (double xr, double xg, double xb);
void cgmpic (const char *cstr);
void cgmver (int nclr);
void chaang (double angle);
void chacod (const char *copt);
void chaspc (double xspc);
void chawth (double xwth);
void chnatt (void);
void chncrv (const char *copt);
void chndot (void);
void chndsh (void);
void chnbar (const char *copt);
void chnpie (const char *copt);
void circ3p (double x1, double y1, double x2, double y2, double x3, double y3,
             double *xm, double *ym, double *r);
void circle (int nx, int ny, int nr);
void circsp (int nspc);
void clip3d (const char *ctyp);
int closfl (int nu);

```

```

void clpbor (const char *copt);
void clpmod (const char *copt);
void clpwin (int nx, int ny, int nw, int nh);
void clrcyc (int index, int iclr);
void clrmod (const char *cmode);
void clswin (int id);
void color (const char *col);
void colran (int nca, int nce);
void colray (const double *zray, int *nray, int n);
void complx (void);
void conclr (const int *nray, int n);
void concrv (const double *xray, const double *yray, int n, double zlev);
void cone3d (double xm, double ym, double zm, double r,
            double h1, double h2, int nsk1, int nsk2);
void confl1 (const double *xray, const double *yray, const double *zray, int n,
            const int *ilray, const int *i2ray, const int *i3ray, int ntri,
            const double *zlev, int nlev);
void congap (double xfac);
void conlab (const char *clab);
void conmat (const double *zmat, int n, int m, double zlev);
void conmod (double xfac, double xquot);
void conn3d (double x, double y, double z);
void connpt (double x, double y);
void conpts (const double *xray, int n, const double *yray, int m,
            const double *zmat, double zlev, double *xpts, double *ypts,
            int maxpts, int *nray, int maxray, int *nlins);
void conshd (const double *xray, int n, const double *yray, int m,
            const double *zmat, const double *zlev, int nlev);
void conshd3d (const double *xray, int n, const double *yray, int m,
            const double *zmat, const double *zlev, int nlev);
void contri (const double *xray, const double *yray, const double *zray, int n,
            const int *ilray, const int *i2ray, const int *i3ray,
            int ntri, double zlev);
void contur (const double *xray, int n, const double *yray, int m,
            const double *zmat, double zlev);
void cross (void);
void crvmat (const double *zmat, int n, int m, int ixpts, int iypts);
void crvqdr (const double *xray, const double *yray, const double *zray,
            int n);
void crvt3d (const double *xray, const double *yray, const double *zray,
            const double *rray, const int *icray, int n);
void crvtri (const double *xray, const double *yray, const double *zray, int n,
            const int *ilray, const int *i2ray, const int *i3ray, int ntri);
int csrkey (void);
void csrlin (int *ix1, int *iy1, int *ix2, int *iy2);
void csrmod (const char *cmode, const char *ckey);
int csrpos (int *ix, int *iy);
void csrpt1 (int *ix, int *iy);
void csrpts (int *ix, int *iy, int nmax, int *n, int *iret);
void csrmov (int *ix, int *iy, int nmax, int *n, int *iret);
void csrrec (int *ix1, int *iy1, int *ix2, int *iy2);
void csrtyp (const char *copt);
void csruni (const char *copt);
void curv3d (const double *xray, const double *yray, const double *zray, int n);
void curv4d (const double *xray, const double *yray, const double *zray,
            const double *wray, int n);
void curve (const double *xray, const double *yray, int n);
void curve3 (const double *xray, const double *yray, const double *zray, int n);
void curvmp (const double *xray, const double *yray, int n);
void curvx3 (const double *xray, double y, const double *zray, int n);
void curvy3 (double x, const double *yray, const double *zray, int n);
void cyli3d (double xm, double ym, double zm, double r, double h,
            int nsk1, int nsk2);
void dash (void);

```

```

void dashl (void);
void dashm (void);
void dbffin (void);
int dbfini (void);
void dbfmod (const char *copt);
void delglb (void);
void digits (int ndig, const char *cax);
void disalf (void);
void disenv (const char *cenv);
void disfin (void);
void disini (void);
void disk3d (double xm, double ym, double zm, double r1, double r2,
             int nsk1, int nsk2);

void doevnt (void);
void dot (void);
void dotl (void);
void duplx (void);
int dwgbut (const char *cstr, int ival);
int dwgerr (void);
char *dwgfil (const char *clab, const char *cstr, const char *cmask);
int dwglis (const char *clab, const char *clis, int ilis);
void dwgmsg (const char *cstr);
char *dwgtxt (const char *clab, const char *cstr);
void ellips (int nx, int ny, int na, int nb);
void endgrf (void);
void erase (void);
void errbar (const double *x, const double *y,
             const double *err1, const double *err2, int n);
void errdev (const char *cdev);
void errfil (const char *cfil);
void errmod (const char *cstr, const char *copt);
void eushft (const char *cnat, const char *cshf);
void expimg (const char *cfil, const char *copt);
void expzlb (const char *cstr);
void fbars (const double *xray, const double *y1ray, const double *y2ray,
            const double *y3ray, const double *y4ray, int n);
int fcha (double x, int ndig, char *cstr);
void field (const double *xray, const double *yray,
            const double *uray, const double *vray, int n, int ivec);
void field3d (const double *x1ray, const double *y1ray, const double *z1ray,
              const double *x2ray, const double *y2ray, const double *z2ray,
              int n, int ivec);
void filbox (int nx, int ny, int nw, int nh);
void filclr (const char *copt);
void filmod (const char *cmod);
void filopt (const char *copt, const char *ckey);
int filsiz (const char *cfl, int *nw, int *nh);
void filwin (int nx, int ny, int nw, int nh);
void fixspc (double xfac);
void flab3d (void);
int flen (double x, int ndig);
void frame (int nfrm);
void frmbar (int nfrm);
void frmclr (int nclr);
void frmess (int nfrm);
void gapcrv (double xgap);
void gapsiz (double gap, const char *cax);
void gaxpar (double a1, double a2, const char *copt, const char *cax,
             double *a, double *b, double *org, double *stp, int *ndig);
char *getalf (void);
int getang (void);
int getbpp (void);
void getclp (int *nx, int *ny, int *nw, int *nh);
int getclr (void);

```

```

void getdig (int *nxdig, int *nydig, int *nzdig);
char *getdsp (void);
char *getfil (void);
void getgrf (double *a, double *e, double *org, double *step, const char *cax);
int gethgt (void);
int gethnm (void);
void getind (int index, double *xr, double *xg, double *xb);
void getlab (char *cx, char *cy, char *cz);
void getlen (int *nxl, int *nyl, int *nzl);
int getlev (void);
int getlin (void);
int getlit (double xp, double yp, double zp,
            double xn, double yn, double zn);
void getmat (const double *xray, const double *yray, const double *zray, int n,
            double *zmat, int nx, int ny, double zval, int *imat, double *wmat);
char *getmfl (void);
char *getmix (const char *copt);
void getor (int *nx0, int *ny0);
void getpag (int *nxpag, int *nypag);
long getpat (void);
int getplv (void);
void getpos (int *nxa, int *nya);
void getran (int *nca, int *nce);
void getres (int *npb, int *nph);
void getrgb (double *xr, double *xg, double *xb);
void getscl (int *nxscl, int *nyscl, int *nzscl);
void getscr (int *nwidth, int *nheight);
char *getshf (const char *copt);
void getspl (int *nxdis, int *nydis, int *nzdis);
void getspl2 (int *nxdis, int *nydis, int *nzdis);
void getsym (int *nxsym, int *nysym);
void gettcl (int *nmaj, int *nmin);
void gettic (int *nxtic, int *nytic, int *nztic);
int gettyp (void);
void *getuni (void);
double getver (void);
void getvk (int *nv, int *nvfx, int *nvfy);
char *getvlt (void);
int getwid (void);
void getwin (int *ix, int *iy, int *nwidth, int *nheight);
int getxid (const char *copt);
void gifmod (const char *cmod, const char *ckey);
int gmxalf (const char *copt, char *ca, char *cb);
void gothic (void);
void grace (int ngrace);
void graf (double xa, double xe, double xorg, double xstp,
          double ya, double ye, double yorg, double ystp);
void graf3 (double xa, double xe, double xorg, double xstp,
           double ya, double ye, double yorg, double ystp,
           double za, double ze, double zorg, double zstp);
void graf3d (double xa, double xe, double xorg, double xstp,
            double ya, double ye, double yorg, double ystp,
            double za, double ze, double zorg, double zstp);
void grafmp (double xa, double xe, double xorg, double xstp,
            double ya, double ye, double yorg, double ystp);
void grafp (double xe, double xorg, double xstp, double yorg, double ystp);
void grdpol (int ixgrid, int iygrid);
void grffin (void);
void grfini (double x1, double y1, double z1,
            double x2, double y2, double z2,
            double x3, double y3, double z3);
void grid (int ixgrid, int iygrid);
void grid3d (int ixgrid, int iygrid, const char *copt);
void gridmp (int ixgrid, int iygrid);

```

```

int  gwgatt (int id, const char *copt);
int  gwgbox (int id);
int  gwgbut (int id);
void gwgfil (int id, char *cfile);
double gwgflt (int id);
int  gwgint (int id);
int  gwglis (int id);
double gwgscl (int id);
void gwgsiz (int id, int *nw, int *nh);
double gwgtbf (int id, int i, int j);
int  gwgtbi (int id, int i, int j);
void gwgtbl (int id, double *xray, int n, int idx, const char *copt);
void gwgtbs (int id, int i, int j, char *s);
void gwgtxt (int id, char *ctext);
int  gwgxid (int id);
void height (int nhchar);
void helve (void);
void helves (void);
void helvet (void);
void histog (const double *xray, int n, double *x, double *y, int *m);
void hname (int nhchar);
void hpgmod (const char *cmod, const char *ckey);
void hsvrgb (double xh, double xs, double xv,
             double xr, double xg, double xb);
void hsym3d (double x);
void hsymbl (int nhsym);
void htitle (int nhtit);
void hwfont (void);
void hwmode (const char *copt, const char *ckey);
void hworig (int nx, int ny);
void hwpage (int nw, int nh);
void hwscal (double xfac);
void imgbox (int nx, int ny, int nw, int nh);
void imgclp (int nx, int ny, int nw, int nh);
void imgfin (void);
void imgfmt (const char *copt);
void imgini (void);
void imgmod (const char *copt);
void imgsiz (int nw, int nh);
void imgtpr (int n);
void inccrv (int ncrv);
int  incdat (int id, int im, int iy);
void incfil (const char *cfil);
void incmrk (int nmrk);
int  indrgb (double xr, double xg, double xb);
void intax (void);
int  intcha (int nx, char *cstr);
int  intlen (int nx);
int  intrgb (double xr, double xg, double xb);
int  intutf (const int *iray, int n, char *cstr, int nmax);
void isopts (const double *xray, int nx, const double *yray, int ny,
             const double *zray, int nz, const double *wmat, double wlev,
             double *xtri, double *ytri, double *ztri, int nmax, int *ntri);
void itmcat (char *clis, const char *cstr);
int  itmcnt (const char *clis);
char *itmstr (const char *clis, int nlis);
void jusbar (const char *copt);
void labclr (int iclr, const char *copt);
void labdig (int ndig, const char *cax);
void labdis (int ndis, const char *cax);
void labels (const char *clab, const char *cax);
void labjus (const char *copt, const char *cax);
void labl3d (const char *copt);
void labmod (const char *ckey, const char *cval, const char *cax);

```

```

void labpos (const char *cpos, const char *cax);
void labtyp (const char *ctyp, const char *cax);
int ldimg (const char *cfil, unsigned short *iray, int nmax, int nc);
void legbgd (int iclr);
void legclr (void);
void legend (const char *cbuf, int ncor);
void legini (char *cbuf, int nlin, int nmaxln);
void leglin (char *cbuf, const char *cstr, int ilin);
void legopt (double x1, double x2, double x3);
void legpat (int ityp, int ithk, int isym, int iclr, long ipat, int ilin);
void legpos (int nx, int ny);
void legsel (const int *nray, int n);
void legtit (const char *cstr);
void legtyp (const char *copt);
void legval (double x, const char *copt);
void lfttit (void);
void licmod (const char *cmod, const char *ckey);
void licpts (const double *xv, const double *yv, int nx, int ny,
             const int *itmat, int *iwmat, double *wmat);

void light (const char *copt);
void linclr (const int *nray, int n);
void lincyc (int index, int ityp);
void line (int nx, int ny, int nu, int nv);
void linesp (double xfac);
void linmod (const char *cmod, const char *ckey);
void lintyp (int ntyp);
void linwid (int i);
void litmod (int id, const char *copt);
void litop3 (int id, double xr, double xg, double xb, const char *copt);
void litopt (int id, double xval, const char *copt);
void litpos (int id, double x, double y, double z, const char *copt);
void lncap (const char *copt);
void lnjoin (const char *copt);
void lnmlt (double x);
void logtic (const char *cmod);
void mapbas (const char *cmod);
void mapfil (const char *cfil, const char *copt);
void mapimg (const char *cfil, double x1, double x2, double x3, double x4,
             double x5, double x6);

void maplab (const char *copt, const char *ckey);
void maplev (const char *cmod);
void mapmod (const char *cmod);
void mappol (double xpol, double ypol);
void mapopt (const char *copt, const char *ckey);
void mapref (double ylower, double yupper);
void mapsph (double xrad);
void marker (int nsym);
void matop3 (double xr, double xg, double xb, const char *copt);
void matopt (double xval, const char *copt);
void mdformat (int nx, int ny, double weight);
void messag (const char *cstr, int nx, int ny);
void metafl (const char *cstr);
void mixalf (void);
void mixleg (void);
void mpaep1 (int i);
void mplang (double x);
void mplclr (int nbg, int nfg);
void mplpos (int nx, int ny);
void mplsiz (int nsize);
void mpslogo (int nx, int ny, int nsize, const char *copt);
void mrkclr (int nclr);
void msgbox (const char *cstr);
void mshclr (int ic);
void mshcrv (int n);

```

```

void mylab (const char *cstr, int itick, const char *cax);
void myline (const int *nray, int n);
void mypat (int iang, int itype, int idens, int icross);
void mysymb (const double *xray, const double *yray, int n, int isym,
             int iflag);
void myvlt (const double *xr, const double *xg, const double *xb, int n);
void namdis (int ndis, const char *cax);
void name (const char *cstr, const char *cax);
void namjus (const char *copt, const char *cax);
void nancrv (const char *copt);
void neglog (double eps);
void newmix (void);
void newpag (void);
int nlmess (const char *cstr);
int nlnumb (double x, int ndig);
void noarln (void);
void nobar (void);
void nobgd (void);
void nochek (void);
void noclip (void);
void nofill (void);
void nograf (void);
void nohide (void);
void noline (const char *cax);
void number (double x, int ndig, int nx, int ny);
void numfmt (const char *copt);
void numode (const char *cdec, const char *cgrp,
             const char *cpos, const char *cfix);
int nwkday (int id, int im, int iy);
int nxlegn (const char *cbuf);
int nxpixl (int ix, int iy);
int nxposn (double x);
int nylegn (const char *cbuf);
int nypixl (int ix, int iy);
int nyposn (double y);
int nzposn (double z);
int openfl (const char *cfil, int nu, int irw);
void opnwin (int id);
void origin (int nx0, int ny0);
void page (int nw, int nh);
void pagera (void);
void pagfll (int nclr);
void paghdr (const char *cstr1, const char *cstr2, int iopt, int idir);
void pagmod (const char *cmod);
void pagorg (const char *cpos);
void pagwin (int nw, int nh);
void patcyc (int index, long ipat);
int pdfbuf (char *cbuf, int nmax);
void pdfmod (const char *cmod, const char *ckey);
void pdfmrk (const char *cstr, const char *copt);
void penwid (double x);
void pie (int nxm, int nym, int nr, double a, double b);
void piebor (int iclr);
void piecbk (void (*callback) (int iseg, double xdat, double xper, int *nrad,
                               int *noff, double *angle, int *nvx, int *nvy, int *idrw,
                               int *iann));
void pieclr (const int *ic1, const int *ic2, int n);
void pieexp (void);
void piegrf (const char *cbuf, int nlin, const double *xray, int nseg);
void pielab (const char *clab, const char *cpos);
void pieopt (double xf, double a);
void pierot (double angle);
void pietyp (const char *ctyp);
void pieval (double x, const char *copt);

```



```

void pievec (int ivec, const char *copt);
void pike3d (double x1, double y1, double z1,
            double x2, double y2, double z2, double r, int nsk1, int nsk2);
void plat3d (double xm, double ym, double zm, double xl, const char *copt);
void plyfin (const char *cfl, const char *cobj);
void plyini (const char *copt);
void pngmod (const char *cmod, const char *ckey);
void point (int nx, int ny, int nb, int nh, int ncol);
void polar (double xe, double xorg, double xstp, double yorg, double ystp);
void polcrv (const char *cpol);
int polclp (const double *xray, const double *yray, int n,
           double *xout, double *yout, int nmax, double xv,
           const char *cedge);

void polmod (const char *cpos, const char *cdir);
void pos2pt (double x, double y, double *xp, double *yp);
void pos3pt (double x, double y, double z, double *xp, double *yp, double *zp);
void posbar (const char *copt);
int posifl (int nu, int nbyte);
void proj3d (const char *copt);
void project (const char *cproj);
void psfont (const char *cfont);
void psmode (const char *cmod);
void pt2pos (double x, double y, double *xp, double *yp);
void pyra3d (double xm, double ym, double zm, double xl,
            double hl, double h2, int n);

void qplbar (const double *yray, int n);
void qplclr (const double *zmat, int n, int m);
void qplcon (const double *zmat, int n, int m, int nlv);
void qplcrv (const double *xray, const double *yray, int n, const char *copt);
void qplot (const double *xray, const double *yray, int n);
void qplpie (const double *xray, int n);
void qplsca (const double *xray, const double *yray, int n);
void qplscl (double a, double e, double org, double stp, const char *copt);
void qplsur (const double *zmat, int n, int m);
void quad3d (double xm, double ym, double zm,
            double xl, double yl, double zl);

int rbfpng (char *cbuf, int nmax);
void rbmp (const char *cfil);
int readfl (int nu, unsigned char *cbuf, int nbyte);
void reawgt (void);
void recfl1 (int nx, int ny, int nw, int nh, int ncol);
void rectan (int nx, int ny, int nw, int nh);
void rel3pt (double x, double y, double z, double *xp, double *yp);
void resatt (void);
void reset (const char *cname);
void revscr (void);
void rgbhsv (double xr, double xg, double xb, double *xh, double *xs, double *xv);
void rgif (const char *cfil);
void rgtlab (void);
void rimage (const char *cfil);
void rlarc (double xm, double ym, double xa, double xb,
           double a, double b, double t);
void rlarea (const double *xray, const double *yray, int n);
void rlcirc (double xm, double ym, double r);
void rlconn (double x, double y);
void rlell (double xm, double ym, double a, double b);
void rline (double x, double y, double u, double v);
void rlmess (const char *cstr, double x, double y);
void rlnumb (double x, int ndig, double xp, double yp);
void rlpie (double xm, double ym, double r, double a, double b);
void rlpoin (double x, double y, int nb, int nh, int ncol);
void rlrec (double x, double y, double xw, double xh);
void rlrnd (double x, double y, double xb, double xh, int irnd);
void rlsec (double xm, double ym, double r1, double r2,

```

```

        double a, double b, int ncol);
void  rlstrt (double x, double y);
void  rlsymb (int nsym, double x, double y);
void  rlvec  (double x1, double y1, double x2, double y2, int ivec);
void  rlwind (double xk, double x, double y, int nwidth, double a);
void  rndrec (int nx, int ny, int nb, int nh, int irnd);
void  rot3d  (double xa, double ya, double za);
void  rpixel (int ix, int iy, int *iclr);
void  rpixls (unsigned char *iray, int ix, int iy, int nw, int nh);
void  rpng   (const char *cfil);
void  rppm   (const char *cfil);
void  rpxrow (unsigned char *iray, int ix, int iy, int n);
void  rtiff  (const char *cfil);
void  rvynam (void);
void  scale  (const char *cscl, const char *cax);
void  sclfac (double xfac);
void  sclmod (const char *cmode);
void  scrmod (const char *cmode);
void  sector (int nx, int ny, int nr1, int nr2, double a, double b, int ncol);
void  selwin (int id);
void  sendbf (void);
void  sendmb (void);
void  sendok (void);
void  serif  (void);
void  setbas (double xfac);
void  setcbk (void (*callbck) (double *x, double *y), const char *copt);
void  setclr (int ncol);
void  setcsr (const char *copt);
void  setexp (double fexp);
void  setfce (const char *copt);
void  setfil (const char *cfil);
void  setgrf (const char *c1, const char *c2, const char *c3, const char *c4);
void  setind (int index, double xr, double xg, double xb);
void  setmix (const char *cstr, const char *cmix);
void  setpag (const char *cpag);
void  setres (int npb, int nph);
void  setrgb (double xr, double xg, double xb);
void  setscl (const double *xray, int n, const char *cax);
void  setvlt (const char *cvlt);
void  setxid (int id, const char *copt);
void  shdafr (const int *inray, const long *ipray, const int *icray, int n);
void  shdasi (const int *inray, const long *ipray, const int *icray, int n);
void  shdaus (const int *inray, const long *ipray, const int *icray, int n);
void  shdcha (void);
void  shdcrv (const double *xlray, const double *ylray, int n1,
             const double *x2ray, const double *y2ray, int n2);
void  shdeur (const int *inray, const long *ipray, const int *icray, int n);
void  shdfac (double xfac);
void  shdmap (const char *cmap);
void  shdmod (const char *copt, const char *ctyp);
void  shdnor (const int *inray, const long *ipray, const int *icray, int n);
void  shdpat (long ipat);
void  shdsou (const int *inray, const long *ipray, const int *icray, int n);
void  shdusa (const int *inray, const long *ipray, const int *icray, int n);
void  shield (const char *careas, const char *cmode);
void  shlcir (int nx, int ny, int nr);
void  shldel (int id);
void  shlell (int nx, int ny, int na, int nb, double t);
int   shlind (void);
void  shlpie (int nx, int ny, int nr, double a, double b);
void  shlpol (const int *nxray, const int *nyray, int n);
void  shlrct (int nx, int ny, int nw, int nh, double t);
void  shlrec (int nx, int ny, int nw, int nh);
void  shlres (int n);

```

```

void shlsur (void);
void shlvis (int id, const char *cmode);
void simplx (void);
int skipfl (int nu, int nbyte);
void smxalf (const char *calph, const char *c1, const char *c2, int n);
void solid (void);
void sortr1 (double *xray, int n, const char *copt);
void sortr2 (double *xray, double *yray, int n, const char *copt);
void spcbar (int n);
void sphe3d (double xm, double ym, double zm, double r, int n, int m);
void spline (const double *xray, const double *yray, int n,
             double *xsray, double *ysray, int *nspl);
void splmod (int ngrad, int npts);
void stmmod (const char *cmode, const char *ckey);
void stmopt (int n, const char *copt);
void stmpts (const double *xmat, const double *ymat, int nx, int ny,
             const double *xp, const double *yp, double x0, double y0,
             double *xray, double *yray, int nmax, int *nray);
void stmpts3d (const double *xv, const double *yv, const double *zv,
              int nx, int ny, int nz, const double *xp, const double *yp,
              const double *zp, double x0, double y0, double z0,
              double *xray, double *yray, double *zray, int nmax, int *nray);
void stmtri (const double *xv, const double *yv, const double *xp,
            const double *yp, int n, const int *ilray, const int *i2ray,
            const int *i3ray, int ntri, const double *xs,
            const double *ys, int nray);
void stmval (double x, const char *copt);
void stream (const double *xmat, const double *ymat, int nx, int ny,
            const double *xp, const double *yp,
            const double *xs, const double *ys, int n);
void stream3d (const double *xv, const double *yv, const double *zv,
              int nx, int ny, int nz, const double *xp, const double *yp,
              const double *zp, const double *xs, const double *ys,
              const double *zs, int n);
void strt3d (double x, double y, double z);
void strtpt (double x, double y);
void surclr (int ictop, int icbot);
void surfce (const double *xray, int n, const double *yray, int m,
            const double *zmat);
void surfcp (double (*zfun)(double x, double y, int i),
            double a1, double a2, double astp,
            double b1, double b2, double bstp);
void surfun (double (*zfun)(double x, double y), int ixpts, double xdel,
            int iypts, double ydel);
void suriso (const double *xray, int nx, const double *yray, int ny,
            const double *zray, int nz, const double *wmat, double wlev);
void surmat (const double *zmat, int nx, int ny, int ixpts, int iypts);
void surmsh (const char *copt);
void suropt (const char *copt);
void surshc (const double *xray, int n, const double *yray, int m,
            const double *zmat, const double *wmat);
void surshd (const double *xray, int n, const double *yray, int m,
            const double *zmat);
void sursze (double xmin, double xmax, double ymin, double ymax);
void surtri (const double *xray, const double *yray, const double *zray, int n,
            const int *ilray, const int *i2ray, const int *i3ray, int ntri);
void survis (const char *cvis);
void swapi2 (short *iray, int n);
void swapi4 (int *iray, int n);
void swgatt (int id, const char *cval, const char *copt);
void swgbgd (int id, double xr, double xg, double xb);
void swgbox (int ip, int ival);
void swgbut (int ip, int ival);
void swgcb (int id, void (*callback) (int i, int *ir), int *iray);

```

```

void swgcb2 (int id, void (*callbck) (int id, int irow, int icol));
void swgcb3 (int id, void (*callbck) (int id, int ival));
void swgcbk (int id, void (*callbck) (int i));
void swgclr (double xr, double xg, double xb, const char *copt);
void swgdrw (double x);
void swgfgd (int id, double xr, double xg, double xb);
void swgfil (int ip, const char *cval);
void swgflt (int ip, double xv, int ndig);
void swgfnt (const char *cfnt, int n);
void swgfoc (int id);
void swghlp (const char *cstr);
void swgint (int ip, int iv);
void swgiop (int n, const char *copt);
void swgjus (const char *ctyp, const char *cwidg);
void swglis (int ip, int ival);
void swgmix (const char *c, const char *cstr);
void swgmrg (int ival, const char *cstr);
void swgoff (int nx, int ny);
void swgopt (const char *cval, const char *copt);
void swgpop (const char *copt);
void swgpos (int nx, int ny);
void swgray (const double *xray, int nray, const char *copt);
void swgscl (int ip, double xval);
void swgsiz (int nx, int ny);
void swgspc (double xw, double xh);
void swgstp (double step);
void swgtbf (int id, double xval, int ndig, int irow, int icol,
             const char *copt);
void swgtbi (int id, int ival, int irow, int icol, const char *copt);
void swgtbl (int id, double *xray, int nray, int ndig, int idx,
             const char *copt);
void swgtbs (int id, const char *cstr, int irow, int icol, const char *copt);
void swgtit (const char *ctit);
void swgtxt (int ip, const char *cval);
void swgtyp (const char *ctyp, const char *cwidg);
void swgval (int ip, double xval);
void swgwin (int nx, int ny, int nw, int nh);
void swgwth (int nchar);
void symb3d (int n, double xm, double ym, double zm);
void symbol (int nsym, int nx, int ny);
void symfil (const char *cdev, const char *cstat);
void symrot (double angle);
int tellfl (int nu);
void texmod (const char *copt);
void texopt (const char *copt, const char *ctyp);
void texval (double x, const char *copt);
void thkc3d (double x);
void thkcrv (int nthk);
void thrfin (void);
void thrini (int n);
void ticks (int itick, const char *cax);
void ticlen (int nmaj, int nmin);
void ticmod (const char *copt, const char *cax);
void ticpos (const char *cpos, const char *cax);
void tifmod (int n, const char *cval, const char *copt);
void tiforg (int nx, int ny);
void tifwin (int nx, int ny, int nw, int nh);
void timopt (void);
void titjus (const char *copt);
void title (void);
void titlin (const char *cstr, int n);
void titpos (const char *copt);
void torus3d (double xm, double ym, double zm, double r1, double r2,
             double h, double a1, double a2, int n, int m);

```

```

void tprfin (void);
void tprini (void);
void tprmod (const char *cmod, const char *ckey);
void tprval (double x);
void tr3axs (double x, double y, double z, double a);
void tr3res (void);
void tr3rot (double a, double b, double c);
void tr3scl (double x, double y, double z);
void tr3shf (double x, double y, double z);
void trfcol (double *xray, int n, const char *cfrom, const char *cto);
void trfco2 (double *xray, double *yray, int n,
            const char *cfrom, const char *cto);
void trfco3 (double *xray, double *yray, double *zray, int n,
            const char *cfrom, const char *cto);
void trfdat (int ndays, int *id, int *im, int *iy);
void trfmat (const double *zmat, int nx, int ny,
            double *zmat2, int nx2, int ny2);
void trfrel (double *xray, double *yray, int n);
void trfres (void);
void trfrot (double xang, int nx, int ny);
void trfscl (double xscl, double yscl);
void trfshf (int nx, int ny);
void tria3d (const double *xtri, const double *ytri, const double *ztri);
int triang (double *xray, double *yray, int n,
            int *ilray, int *i2ray, int *i3ray, int nmax);
void triflc (const double *xray, const double *yray, const int *iray, int n);
void trifll (const double *xray, const double *yray);
void triplx (void);
void tripts (const double *xray, const double *yray, const double *zray,
            int n,
            const int *ilray, const int *i2ray, const int *i3ray, int ntri,
            double zlev, double *xpts, double *ypts, int maxpts,
            int *nptray, int maxray, int *nlins);
int trmlen (const char *cstr);
void ttfont (const char *cfnt);
void tube3d (double x1, double y1, double z1,
            double x2, double y2, double z2, double r, int nsk1, int nsk2);
void txtbgd (int n);
void txtjus (const char *copt);
void txture (int *itmat, int nx, int ny);
void unit (void *fp);
void units (const char *copt);
void upstr (char *cstr);
int utfint (const char *cstr, int *iray, int n);
void vang3d (double a);
void vclp3d (double x1, double x2);
void vecclr (int iclr);
void vecf3d (const double *xv, const double *yv, const double *zv,
            const double *xp, const double *yp, const double *zp,
            int n, int ivec);
void vecfld (const double *xv, const double *yv,
            const double *xp, const double *yp, int n, int ivec);
void vecmat (const double *xmat, const double *ymat, int nx, int ny,
            const double *xp, const double *yp, int ivec);
void vecmat3d (const double *xv, const double *yv, const double *zv,
            int nx, int ny, int nz, const double *xp, const double *yp,
            const double *zp, int ivec);
void vecopt (double x, const char *copt);
void vector (int nx1, int ny1, int nx2, int ny2, int ivec);
void vectr3 (double x1, double y1, double z1,
            double x2, double y2, double z2, int ivec);
void vfoc3d (double x, double y, double z, const char *cvview);
void view3d (double xv, double yv, double zv, const char *cvu);
void vkxbar (int nvfx);

```

```

void vkybar (int nvfy);
void vkytit (int nvfy);
void vltfil (const char *cfl, const char *copt);
void vscl3d (double x);
void vtx3d (const double *xray, const double *yray, const double *zray,
int n, const char *copt);
void vtxc3d (const double *xray, const double *yray, const double *zray,
const int *ic, int n,
const char *copt);
void vtxn3d (const double *xray, const double *yray, const double *zray,
const double *xn, const double *yn, const double *zn,
int n, const char *copt);

void vup3d (double a);
int wgapp (int ip, const char *clab);
int wgappb (int ip, unsigned const char *iray, int nw, int nh);
int wgbas (int ip, const char *ctyp);
int wgbox (int ip, const char *cstr, int isel);
int wgbut (int ip, const char *cstr, int ival);
int wgcmd (int ip, const char *clab, const char *cmd);
int wgdlls (int ip, const char *cstr, int isel);
int wgdraw (int ip);
int wgfil (int ip, const char *clab, const char *cstr, const char *cmask);
void wgfin (void);
int wgicon (int ip, const char *clab, int nw, int nh, const char *cfl);
int wgimg (int ip, const char *clab, const unsigned char *iray,
int nw, int nh);

int wgini (const char *ctyp);
int wglab (int ip, const char *cstr);
int wglis (int ip, const char *cstr, int isel);
int wgltxt (int ip, const char *clab, const char *ctext, int iper);
int wgok (int ip);
int wgpbar (int ip, double x1, double x2, double xval);
int wgpbut (int ip, const char *clab);
int wgpicon (int ip, const char *clab, int nw, int nh, const char *cfl);
int wgpimg (int ip, const char *clab, const unsigned char *iray,
int nw, int nh);

int wgpob (int ip, const char *clab);
int wgpobp (int ip, unsigned const char *iray, int nw, int nh);
int wgquit (int ip);
int wgscl (int ip, const char *cstr, double x1, double x2, double xval,
int ndez);

int wgsep (int ip);
int wgstxt (int ip, int nsize, int nmax);
int wgtbl (int ip, int nrow, int ncol);
int wgtxt (int ip, const char *cstr);
void widbar (int nzb);
void wimage (const char *cfl);
void winapp (const char *copt);
void wincbk (void (*callback) (int id, int nx, int ny, int nw, int nh),
const char *copt);
void windbr (double xk, int nx, int ny, int nwidth, double a);
void window (int nx, int ny, int nw, int nh);
void winfin (int iopt);
void winfnt (const char *cfont);
int winid (void);
void winkey (const char *copt);
void winmod (const char *copt);
void winopt (int iopt, const char *copt);
void winsiz (int nw, int nh);
void wintit (const char *cstr);
void wmfmod (const char *cmod, const char *ckey);
void world (void);
void wpixel (int ix, int iy, int iclr);
void wpxls (const unsigned char *iray, int ix, int iy, int nw, int nh);

```

```

void wpxrow (const unsigned char *iray, int ix, int iy, int n);
int writfl (int nu, const unsigned char *cbuf, int nbyte);
void wtiff (const char *cfil);
void x11fnt (const char *cfont, const char *copt);
void x11mod (const char *copt);
double x2dpos (double x, double y);
double x3dabs (double x, double y, double z);
double x3dpos (double x, double y, double z);
double x3drel (double x, double y, double z);
void xaxgit (void);
void xaxis (double xa, double xe, double xorg, double xstp,
            int nl, const char *cstr, int it, int nx, int ny);
void xaxlg (double xa, double xe, double xorg, double xstp,
            int nl, const char *cstr, int it, int nx, int ny);
void xaxmap (double xa, double xe, double xorg, double xstp,
            const char *cstr, int it, int ny);
void xcross (void);
void xdraw (double x, double y);
double xinvr (int n);
void xmove (double x, double y);
double xposn (double x);
double y2dpos (double x, double y);
double y3dabs (double x, double y, double z);
double y3dpos (double x, double y, double z);
double y3drel (double x, double y, double z);
void yaxgit (void);
void yaxis (double ya, double ye, double yor, double ystp,
            int nl, const char *cstr, int it, int nx, int ny);
void yaxlg (double ya, double ye, double yor, double ystp,
            int nl, const char *cstr, int it, int nx, int ny);
void yaxmap (double ya, double ye, double yor, double ystp,
            const char *cstr, int it, int ny);
void ycross (void);
double yinvr (int n);
double yposn (double y);
double z3dpos (double x, double y, double z);
void zaxis (double za, double ze, double zor, double zstp,
            int nl, const char *cstr, int it, int id, int nx, int ny);
void zaxlg (double za, double ze, double zor, double zstp,
            int nl, const char *cstr, int it, int id, int nx, int ny);
void zbfers (void);
void zbffin (void);
int zbfini (void);
void zbflin (double x1, double y1, double z1, double x2, double y2, double z2);
void zbfmod (const char *copt);
void zbfres (void);
void zbfsc1 (double x);
void zbftri (const double *x, const double *y, const double *z, const int *ic);
void zscale (double za, double ze);

#ifdef __cplusplus
}
#endif
#endif /* _DISLIN_H_ */

```