

STATUS OF THE AQUA-RICH PROJECT

K. Zuber , for the **AQUA-RICH** project

Lehrstuhl f. Exp. Physik IV, University of Dortmund, 44221 Dortmund, Germany.

`zuber@physik.uni-dortmund.de`

We describe a 1 Mt water volume in form of a RICH - detector suitable for detection of NNN (Neutrinos, Nucleon decay and superNovae). It has a 124 m diameter outer geodesic dome supporting 3000 inward facing, 1 m diameter hybrid photo diodes mHPDs (3.5% cover) each with 512 pixels of 40 x 40 mm² looking through transparent holes in a 124 m diameter spherical mirror balloon. An inner geodesic dome of 62 m diameter supports 3800 outward facing dHPDs (25% cover). The dHPDs see focused Cherenkov rings which give the best pattern recognition and determine particle momentum from multiple scattering. The mHPDs determine the direction of tracks and their vertex point in space. The photon energy acceptance of mHPDs is 5 times that of dHPDs thus they both detect about 200 photons per meter tracklength. This device can detect about 30000 atmospheric neutrinos per year, be sensitive to proton decay with lifetime of about $6.2 \cdot 10^{35}$ years and detect supernovae out to a radius of 1 Mpc (includes Andromeda). The algorithms and calculations to determine particle momentum, direction and vertex as well as the current status will be presented.