PULSAR CONTRIBUTION TO HIGH ENERGY COSMIC RAYS

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We derive energy spectra of high energy particles which could be produced by Galactic pulsars. Adopting the rotating magnetic dipole model we assume the most favourable case that all rotational energy loss goes into cosmic rays. For the assumed distribution of initial magnetic fields (Gaussian distribution for logB) and initial periods (flat and gamma functions) we obtain almost power law production spectra in the energy region 10^16 - 10^18eV with the power index in the differential spectrum ranging from about -2.7 to -1.7. For reasonably assumed lifetime and confinement volume, predicted fluxes, both for iron nuclei and protons, often exceed the observed one. Thus, if pulsars were to be responsible for the observations, their cosmic ray efficiency has to be 10^-4 - 10^-1 and there should be relatively few pulsars born with periods equal or less than 10ms.