The correlation between radio-luminosity and spindown energy loss in pulsars

X. H. Cui, Y. L. Yue, G. J. Qiao and R. X. Xu School of physics, Peking University, Beijing 100871

It is conventionally suggested that the beamed radio emission of pulsars could have three components: core, inner-cone, and outer-cone. A pulse-profile observed depends on the geometry of an observer and the star (i.e., inclination angle and viewing angle), and the intrinsic radio-luminosities of pulsars should accordingly not be the detected ones that are averaged over an emission phase. Based on a large sample with high quality, a relationship between intrinsic radio-luminosity and rotation-energy loss rate is obtained, with the inclusion of the geometrical effects, for both normal and millisecond pulsars. An acceptable pulsar radio-emission model should certainly be able to reproduce this correlation.