Detection of a Burst of Neutrinos

The Super-detector Collaboration

We report the detection of a burst of 5000 electron antineutrinos in a time interval of 15s on June 2nd 2005. Our detector has an active volume of 40000 tonnes of water and registers electron antineutrinos through the reaction

$$\overline{\nu_e} + \mathrm{p} \rightarrow \mathrm{n} + \mathrm{e}^+$$

with cross section 9.77×10^{-42} $(E/10\ \mathrm{MeV})^2$. The overall detection efficiency is 70%. Unfortunately this reaction supplies no directional information and no optical detection of a supernova has been reported.