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Brightest Solar Flare Neutrino Astronomy in SK, HK and Icecube

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Largest Solar Flare did burst on Earth hardest gamma photons of pion nature. The associated charged pion decay must also shine hard muon and electron neutrinos. Their detection and their flavor might be observable in largest present or future underground detectors if, at flare peak, they are overcoming the steady atmospheric noise. The present Super Kamiokande neutrino detector recently amplified by Gadolinium, might record, in years, the relic cosmic Supernovae noises at tens MeV energy; at same tens MeV energies, the brightest Solar neutrino flare might be observable by one or few events. Hyper Kamikande megaton will surpass the SK mass, better allowing a detection of Solar electron, muon anti-neutrino flare at tens and hundreds MeV. Finally the Icecube inner core, whose tens megaton volume and whose energy threshold might reach few or ten GeV ones, might also rarely record brightest neutrinos both of electron and muon nature possibly tracking also their solar arrival direction. Tau flavor neutrino presence by flight mixing is almost undetectable because soft solar flare spectra and the large tau mass threshold, but in principle it might be somehow observed.

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