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Exploring the extension of IceCube's supernova observational reach using HE neutrinos from CCSNe ejecta-CSM interaction

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IceCube monitors for supernovae using low energy neutrinos (tens of MeV), observing our galaxy up to the large Magellanic cloud. Using the shock between the ejecta and the circumstellar material from the progenitor star, a high flux of high-energy neutrinos in the order of TeV and above can be created. These neutrinos would reach Earth 0.1 day – 1 year after the low-energy neutrinos. I will explore how IceCube's observation reach can be extended using these high-energy neutrinos.

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