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Detecting High-Energy Neutrinos from Galactic Supernovae with ATLAS

ATLAS, a collider detector, can measure the flux of high-energy supernova neutrinos, which originate in the circumstellar medium from days to months after the explosion. Simulating predicted fluxes, we find at most around 0.1–1 starting events and around 10–100 throughgoing events from a supernova 10 kpc away. Possible Galactic supernovae from Betelgeuse and Eta Carinae are considered as demonstrative examples. We conclude that even with limited statistics, ATLAS has the ability to discriminate among flavors and between neutrinos and antineutrinos, making it a unique supernova neutrino observatory.

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