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Deep-ocean iron-60 as a possible signature of a nearby supernova

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Abstract. Within the history of the earth, it is very likely that one or more supernova explosions occurred nearby ($\lesssim$ tens of pc). Events at this distance produce a host of radioactive nuclei and deposit them on the earth, via enhanced cosmogenic processes as well as by passage of the nucleosynthesis-enriched supernova blast wave into the solar system. Recently, live ^{60}Fe ($t_{1/2} = 1.5\,$Myr) has been detected in a deep-ocean ferromanganese crust. It is shown that the observed signal appears to be two orders of magnitude above known backgrounds (pre-dominantly cosmogenic ^{60}Fe in dust accreted by the earth). If the detection is interpreted as a signature of a supernova, the event would have occurred within the last $\lesssim 5$ Myr, at a distance $\lesssim 30$ pc. Future tests of this scenario are brie y discussed.

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