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Constraining dark U(1) models with Supernova 1987 data

Recent $^8Be^*$ decay anomaly suggests the existence of a light dark boson which has a suppressed coupling to proton compared to its coupling to neutron. The simple dark $U(1)$ model constructed by introducing a kinetic mixing between standard model $U(1)_Y$ gauge boson and the dark boson needs to be generalized to satisfy the above requirement. The couplings of dark boson to standard model fermions in such generalized dark U(1) models can be constrained by Supernova 1987 data. We shall present these constraints with the recently proposed plasma effect in supernova taken into account.

Experimental Collaboration

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