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## **Multimessenger constraints to electrophilic feebly interacting particles from supernovae**

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Several extensions of the Standard Model predict the existence of exotic feebly interacting particles (FIPs) that would be abundantly produced by supernova (SN) explosions. Some remarkable examples of FIPs are sterile neutrinos, dark photons and axion-like particles, with the common feature of interacting with electrons and positrons. In this work we constrain the amount of electrons/positrons produced by SN explosions due to the decay of FIPs in the interstellar medium. We use local electron/positron measurements as well as keV-to-MeV gamma-ray data in different regions of the sky to constrain the inverse Compton and bremsstrahlung emissions from the injected electron population, and the data from the 511 keV line produced from the annihilation of positrons in the interstellar medium. We show that the strongest constraints come from the 511 KeV emission and improve the current constraints on FIPs thanks to the use of refined astrophysical models.

### **Submitted on behalf of a Collaboration?**

No

**Session Classification:** Poster session

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