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Novel Astrophysical Constraint on Axion-Photon Coupling

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Abstract:

We point out that massive stars can serve as sensitive probes of the axion-photon interaction. Specifically, for stars of about 10 solar masses the blue loop phase of the evolution could be shortened or entirely eliminated by the axion energy losses from the helium-burning core, contrary to observations. This allows to constraint the axion-photon coupling to a value about 20% below the current bound.

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