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Nearby Pulsars and The Cosmic Ray Positron Excess

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Measurements of the Geminga and B0656+14 pulsars by HAWC and Milagro indicate that these objects generate significant fluxes of very high-energy electrons. From the very high-energy gamma-ray intensity and spectrum of these pulsars, one can calculate their expected contributions to the local cosmic-ray positron spectrum. From these considerations, we find that pulsars produce a flux of high-energy positrons that is similar in spectrum and magnitude to the positron fraction measured by PAMELA and AMS-02. In light of this result, we conclude that it is very likely that pulsars provide the dominant contribution to the long perplexing cosmic-ray positron excess. I will also discuss the implications of these results for pulsars in the Galactic Center region.

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