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The Fermi Galactic Center excess as a signal from Bursts of Cosmic-Rays ILIAS CHOLIS, Johns Hopkins University, CARMELO EVOLI, Gran Sasso Science Institute, FRANCESCA CALORE, University of Amsterdam, TIM LINDEN, Ohio State University, CHRISTOPH WENIGER, University of Amsterdam, DAN HOOPER, Fermi National Accelerator Laboratory — The possible gamma-ray excess in the inner Galaxy and the Galactic center suggested by Fermi-LAT observations has triggered great interest in the astro-particle physics community. Among its various interpretations have been WIMP dark matter annihilations, gamma-ray emission from a population of millisecond pulsars, or emission from cosmic rays injected in a sequence of burst-like events or continuously at the Galactic Center. Accounting for the model systematics coming from the Galactic diffuse emission in the inner part of our Galaxy, we will present a comprehensive study of the latter possibility. A small series of outbursts, which took place approximately a million years ago, and 100s of thousands years ago and more recently can account for the observed gamma-ray signal. Furthermore strong re-acceleration and rapid synchrotron cooling conditions within the inner tens of pc of the Galaxy, could explain the hard spectrum of the observed gamma-ray excess. In fact, a connection to the Fermi Bubbles can be made.

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