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The Galactic electron and positron ”excesses”: astrophysical versus dark matter interpretations

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The observation by PAMELA of a rising positron fraction up to 100 GeV, further complemented with the ATIC / Fermi / HESS data on the electron+positron spectrum up to a few TeV, has led to significant adjustments in our understanding of the local high energy electron-positron budget. Many interpretation attempts have invoked dark matter annihilation or decay to fill the gap between the “standard” predictions and the apparent “excesses”, while some more conventional explanations were proposed from studying the contributions of local pulsars and/or supernova remnants. In this talk, we will discuss the status of these different scenarios, and we will sketch a potential roadmap (i) to close the case of the positron “excess” (ii) for future improvements in our general understanding of cosmic ray electrons and positrons.

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