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Unveil the origin of cosmic-ray leptons within a coherent multi-channel propagation scenario

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The interpretation of cosmic-ray (CR) data still represents a major challenge that experiments have to face: a coherent interpretation of the measured CR spectra is hampered by our incomplete knowledge about both the acceleration mechanisms and the transport properties across the Galaxy. The main challenge in this context is to identify a unified picture that includes all the available observables. To this aim, we first perform a multi-channel fit of the available CR data based on the DRAGON numerical code, to set the relevant propagation parameters. On top of that, we discuss several physically-motivated possibilities (i.e. recent burst, constant injection, time-dependent emission) for the injection of e^+e^- pairs accelerated at nearby antimatter factories, such as pulsar wind nebulae, and compute their propagation. Finally, we address the all-lepton spectrum and assess the contributions of both young, nearby supernova remnants, and possibly an additional hidden source, to the observed CR lepton flux above ~ 1 TeV recently measured by H.E.S.S., VERITAS, CALET and DAMPE.

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