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Photons and neutrinos from AGNs: a review on hadronic radiative models

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Jets from super-massive-black-holes radiate photons over the whole electromagnetic spectrum, from the radio band up to TeV gamma-rays. Understanding the radiative mechanisms at work is a fundamental step for the study of particle acceleration in black-hole's jets, and to constrain jets structure, composition, and propagation. Using the information from multi-wavelength observations, several radiative models have been developed in the last decades. They can be divided into two families, leptonic models and hadronic models, depending on the particles that are responsible for the high-energy emission: electrons/positrons or protons, respectively. While the two models are usually degenerate in their photon emission, neutrinos can only be produced in hadronic scenarios and can be seen as the smoking gun for proton acceleration in black-hole's jets. Recent results from neutrino astronomy, providing evidences for neutrino emission from active galactic nuclei, have renewed interest in hadronic radiative scenarios. In this talk I will review hadronic radiative processes with an emphasis on recent applications to multi-messenger (photon-neutrino) data.

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