Decays of Strange & Charmed Hadrons as New Hunting Grounds for Dark Photons and Sterile Neutrinos

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Abstract: The flavor-changing neutral current (FCNC) decays of strange or charmed hadrons with missing energy are sensitive probes of new physics (NP) beyond the standard model (SM). In the presence of NP, the missing energy could be carried away by one or more invisible nonstandard particles, and the decay rates might be much enhanced relative to their SM counterparts, which are very suppressed. This talk presents some highlights of recent theoretical studies on processes of this kind which may be within reach of searches in the near future. Of interest here are NP cases where either a massless dark photon or sterile neutrinos act as the invisibles. Such scenarios could contain FCNC hyperon (kaon) decays with missing energy having rates possibly big enough to be discoverable at BESIII (KOTO & NA62). Similar situations could arise in the charm sector which are potentially testable at BESIII & Belle II.