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A New Mechanism for Dynamical Dark Energy in Light of DESI Observations

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Recent results from the DESI survey provide compelling evidence for a dynamical dark energy component, challenging the long-standing cosmological constant paradigm. In this talk, I will present a mechanism based on chameleon dark energy—an interacting quintessential scalar field dark energy and dark matter model mediated by a Yukawa-type coupling. This fifth-force framework not only allows for a natural phantom crossing in the dark energy equation of state, as favored by DESI data, but also offers the first statistically significant detection of dark sector interaction. I will discuss the theoretical foundation of this model and its observational signatures, emphasizing how it aligns with the latest DESI constraints.

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