

Abstract Submitted
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**Quantum Field Theory of Interacting Dark Matter/Dark Energy:
Dark Monodromies** TERESA HAMILL, UC Davis, GUIDO D'AMICO, CERN,
NEMANJA KALOPER, UC Davis — We discuss how to formulate a quantum field
theory of dark energy interacting with dark matter. We show that the propos-
als based on the assumption that dark matter is made up of heavy particles with
masses which are very sensitive to the value of dark energy are strongly constrained.
Quintessence-generated long range forces and radiative stability of the quintessence
potential require that such dark matter and dark energy are completely decoupled.
However, if dark energy and a fraction of dark matter are very light axions, they can
have significant mixings which are radiatively stable and perfectly consistent with
quantum field theory. Such models can naturally occur in multi-axion realizations
of monodromies. The mixings yield interesting signatures which are observable and
are within current cosmological limits but could be constrained further by future
observations.

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