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Vacuum Decay of de Sitter Space EMIL MOTTOLA, Los Alamos National laboratory, PAUL ANDERSON, Wake Forest University, DILLON SANDERS, North Carolina State University — de Sitter space is unstable to particle creation, even for a massive free field theory with no self-interactions. The O(4,1) de Sitter invariant state is a definite phase coherent superposition of particle and anti-particle solutions in both the asymptotic past and future, and therefore is not a true vacuum state. The decay rate is studied both analytically and numerically by adiabatically switching on and off of de Sitter background is studied analytically and numerically. Possible consequences for the sensitivity to initial conditions in inflation and a theory of vacuum dark energy are discussed.

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