Breaking of de Sitter Symmetry

We show that an interacting spin-0 field on a de Sitter space background will break the underlying de Sitter symmetry. This is done first for a (1+1) de Sitter space where a boson-fermion correspondence permits us to solve certain interacting theories by transforming them into free ones of opposite statistics. A massless boson interacting by a sine-Gordon potential is shown to be equivalent to a free massive fermion with the mass depending on the de Sitter time thus breaking the symmetry explicitly. We then show that for larger dimensions and any boson potential, to one loop, an anomaly develops and the currents generating the de Sitter transformations are not conserved.

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