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Problems of vacuum energy and their possible solution

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A dynamical mechanism for vacuum energy compensation in both de Sitter (dS) and anti-de Sitter (AdS) space-times is discussed. The proposed cosmological model relies on a non-minimal coupling between a scalar field and the curvature scalar. We demonstrate that this mechanism efficiently eliminates huge initial vacuum energies (both positive and negative), dynamically driving the curvature scalar down to zero. In both cases, the universe enters a power-law expansion regime typical for a cosmology dominated by relativistic matter.

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