# An instability of the standard model of cosmology creates the anomalous acceleration without dark energy

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**Abstract**

We identify the condition for smoothness at the centre of spherically symmetric solutions of Einstein's original equations without the cosmological constant or dark energy. We use this to derive a universal phase portrait which describes general, smooth, spherically symmetric solutions near the centre of symmetry when the pressure $p$=0. In this phase portrait, the critical $k$=0 Friedmann space–time appears as a saddle rest point which is unstable to spherical perturbations. This raises the question as to whether the Friedmann space–time

is observable by redshift versus luminosity measurements looking outwards from any point. The unstable manifold of the saddle rest point corresponding to Friedmann describes the evolution of local uniformly expanding space–times whose accelerations closely mimic the effects of dark energy. A unique simple wave perturbation from the radiation epoch is shown to trigger the instability, match the accelerations of dark energy up to second order and distinguish the theory from dark energy at third order. In this sense, anomalous accelerations are not only consistent with Einstein's original theory of general relativity, but are a prediction of it without the cosmological constant or dark energy.

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