

Curvature force and dark energy

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Abstract

A curvature self-interaction of the cosmic gas is shown to mimic a cosmological constant or other forms of dark energy, such as a rolling tachyon condensate or a Chaplygin gas. Any given Hubble rate and deceleration parameter can be traced back to the action of an effective curvature force on the gas particles. This force self-consistently reacts back on the cosmological dynamics. The links between an imperfect fluid description, a kinetic description with effective antifriction forces and curvature forces, which represent a non-minimal coupling of gravity to matter, are established.
