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Chaplygin-gas Solutions of $f(R)$ Gravity

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Abstract content (Max 300 words) Formatting & Special chars

We explore exact $f(R)$ gravity solutions that mimic Chaplygin-gas inspired Lambda CDM cosmology. Starting with the original, generalized and modified Chaplygin gas equations of state, we reconstruct the forms of $f(R)$ Lagrangians. The resulting solutions are generally quadratic in the Ricci scalar, but have appropriate Lambda CDM solutions in limiting cases. These solutions, given appropriate initial conditions, can be potential candidates for scalar field-driven early universe expansion (inflation) and dark energy-driven late-time cosmic acceleration.

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