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Partially Massless Gravity in de Sitter Space LAURA JOHNSON, Case Western Reserve Univ, CLAUDIA DE RHAM, Imperial College, KURT HINTERBICHLER, Case Western Reserve Univ — Adding a mass to the graviton is a promising way to get an accelerating universe without dark energy. When a mass term is added to the Einstein-Hilbert action, it gives the graviton 3 extra degrees of freedom, in addition to the standard 2 of a massless graviton. The new degrees of freedom become strongly coupled at a low scale, limiting the theory's naive range of applicability. However, in the space-time of an accelerating universe (which approximates our early universe during inflation and the phase our universe is currently entering into), a linear massive graviton can obtain a new symmetry known as the partially massless symmetry. If this partially massless symmetry were exact, the value of the cosmological constant would be set by the graviton mass, potentially explaining of the smallness of our cosmological constant. We examine the partially massless symmetry in the full non-linear theory of massive gravity. The full non-linear theory does not have this symmetry, but we find that nevertheless the strong coupling scale is raised, giving a wider range of applicability of the theory.

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