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Weak Lensing in Modified Gravity: A 'Plug-and-Play' Approach

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At a time when understanding the accelerated expansion of the universe is one of the key questions of cosmology, we are compelled to examine the possibility of modifications to general relativity on very large scales. To do so, we consider the weak lensing power spectrum, for which deviations from the standard general relativistic form may be hallmarks of modified gravity. However, computing this quantity from scratch for each of the many theories of modified gravity can be intensive and inefficient. We consider instead linear-order deviations from general relativity and Lambda-CDM, motivated by the results of recent cosmological surveys. We hence construct an expression for the deviation of the weak lensing power spectrum from its general relativistic value, which has the form of an integral over two terms: a 'kernel', which is dependent only on GR+LCDM, and a 'source', which encompasses all deviations from this standard theory. This form provides a much more efficient way of computing the weak lensing power spectrum in each theory of gravity. It hence allows for easier comparison between theory and observation, as well as permitting more straightforward forecasting of constraints from upcoming surveys. I will discuss our derivation of this expression and demonstrate its application to illustrative modified gravity examples.

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