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New analytical results for massive inflationary correlators at tree and loop orders

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I will report a few new methods and results we recently obtained on the analytical computation of cosmological correlators with massive exchanges. At the tree level, we derive a complete set of differential equations for an arbitrary number of massive exchanges. We find a straightforward way to directly write down the analytical solution in terms of multivariate hypergeometric functions. The solution has a neat interpretation as the sum of all possible cuts of a massive family tree. At the 1-loop order, we develop a new method, combining spectral decomposition and dispersion techniques, which allows us to find new and much simplified analytical expressions for massive bubble loop diagrams, which have a simple interpretation as the sum of all quasi-normal modes and their descendants.

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