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An On-Shell Bootstrap Program of Cosmological Correlators

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We develop a new bootstrap strategy for cosmological correlators at loop level, which we call spectral dispersion. It is based on two conceptual observations that a correlator can be recovered from its on-shell data, also known as nonlocal signals, by analyticity up to local counterterms, and that the on-shell data for a loop process take the form of a discrete sum over quasinormal modes. Technically, our method combines the dS spectral decomposition with dispersion relations. Using this technique, we bootstrap new results in a simple and intuitive form for 3-point and 4-point correlators with 1-loop massive exchanges of scalar and vector bosons, either directly or derivatively coupled. Applications of this bootstrap technique to higher spins and higher-loop banana graphs are also straightforward.

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