

## Recovery of gravitational perturbations from the Cosmic Microwave Background

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**Abstract:** Cosmic Microwave Background (CMB) is the radiation remnant from the Big Bang and is considered as a primary source of information regarding the early universe. From the work of Sachs and Wolfe (1967), it is known that one can extract an X-ray transform or the light ray transform of the early gravitational perturbations by considering the linearization of the CMB anisotropies. In this talk, we discuss some results on the inverse problem. First, we study the microlocal properties of the light ray transform and obtain results on recovering singularities of gravitational anomalies such as cosmic strings. Second, we consider the scalar perturbation in a FLRW universe and show that the perturbation can be stably recovered.