



復旦大學

Fudan University



复旦大学物理系物质科学报告

Physics Department Colloquium

Relic Gravitational Wave: Production and Regularization

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Abstract: As a prediction by Einstein in 1916, gravitational wave, propagating at speed of light, is of an intrinsic portion of the theory of general relativity.

Relic gravitational wave (RGW) is originated from the tensor part of fluctuations of space-time metric in the inflationary stage of the very-early Universe. Ever since, RGW has evolved into a stochastic, fluctuating field, which exists everywhere in the Universe today.

We present an analytic solution of RGW, which naturally consists of two parts: the vacuum, and the excitations. The latter, called gravitons, are produced at the transitions between several stages of cosmic expansion.

Both vacuum and excitation parts of the RGW spectrum are plagued by divergences at high frequencies. A cutoff procedure, i.e, adiabatic regularization, can be performed at different times, all making the vacuum part finite. The divergence of excitation part can be removed by other physical arguments. The resulting spectrum serves as one of major targets of the current GW detections.

Time: 2:00pm, Tuesday, May 26, 2015

Location: Physics Building, Room 221B

(Cookies and coffee will be served from 1:30 pm)