Contribution ID: **183** Type: **Talk**

Gravitational memory effects and Bondi-Metzner-Sachs symmetries in scalar-tensor theories

Tuesday, 8 September 2020 14:12 (7 minutes)

The relation between gravitational memory effects and Bondi-Metzner-Sachs symmetries of the asymptotically flat spacetimes is studied in the scalar-tensor theory. For this purpose, the solutions to the equations of motion near the future null infinity are obtained in the generalized Bondi-Sachs coordinates with a suitable determinant condition. It turns out that the Bondi-Metzner-Sachs group is also a semi-direct product of an infinitesimal dimensional supertranslation group and the Lorentz group as in general relativity. There are also degenerate vacua in both the tensor and the scalar sectors in the scalar-tensor theory. The supertranslation relates the vacua in the tensor sector, while in the scalar sector, it is the Lorentz transformation that transforms the vacua to each other. So there are the tensor memory effect similar to the one in general relativity, and the scalar memory effect, which is new. The evolution equations for the Bondi mass and angular momentum aspects suggest that the null energy fluxes and the angular momentum fluxes across the null infinity induce the transition among the vacua in the tensor and the scalar sectors, respectively.

Primary author: HOU, Shaoqi (Wuhan University)

Presenter: HOU, Shaoqi (Wuhan University)

Session Classification: X- & CR RAYS, QM, SNOVAE, GRAVITY, DM, COSMOLOGY, PARTICLES, COMPACT STARS, GALAXIES