

Spinoptics in the presence of axion-like particles

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In curved spacetime, the trajectory of a light ray is described by a geodesic under the geometric optics approximation. However, this approximation is valid only locally and is not justified in the all spacetime regions. If it breaks down, the polarization of light can affect its propagation. In this presentation, we consider light propagating through an axion field in spinoptics approximation. When the polarization is taken into account, the photon-axion coupling introduces an additional acceleration term into the ray equation. This acceleration causes the trajectories to differ depending on the helicity of the light in the presence of an axion field.

Presenter: TAKEUCHI, Tomoki

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