

Dissecting Axion Around SMBH with EHT/ngEHT

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Ultralight bosons can potentially accumulate around these supermassive black holes and form a gravitational atom-like bound state. A new way to look for the gravitational atom made of axion is through birefringence effect from the axion-photon coupling. The presence of coherently oscillating axion leads to a frequency independent oscillation to the electric vector position angle (EVPA) of the linearly polarized radiation. One can also dissect the profile of the gravitational atom by correlating the spatial and temporal variation of the EVPAs.

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