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## Observational signature of grain growth in the protoplanetary disk around young star LkHa 330

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Grain growth is an initial step toward planet formation since it involves the coagulation of approximately micron-sized dust, resulting in planetesimals and finally planets. We have conducted H-band (1.6  $\mu$ m) linear polarimetric observations by Subaru telescope and 0.88 mm interferometric observations by Submillimeter Array toward a transitional disk around the intermediate-mass pre-main sequence star LkHa 330. The observations show a pair of asymmetric spiral arms in the disk, suggesting that a massive unseen (proto)planet exists in the disk as indicated by recent global hydro simulations. The possibility of grain growth that can generate the asymmetric structure was investigated through the opacity index ( $\beta$ ) from the observed slope of the spectral energy distribution between 0.88 mm and 1.3 mm wavelength taken by several interferometric observations. The results imply that grains are indistinguishable from the interstellar medium dust in the east side ( $\beta$ ~2.0), but much smaller in the west side ( $\beta$ ~0.7), indicating differential grain growth or dust trapping in the spiral arms. Combining the results of near-infrared and submillimeter observations at centimeter wavelength and differential polarization imaging in other bands (Y to K) with extreme adaptive optics imagers are required to understand how large dust grains form and to further explore the dust distribution in the disk.

## Biography

Eiji Akiyama has obtained his PhD in 2012 from Ibaraki University, Japan. He has been working as a Science Staff of the Atacama Large Millimeter/submillimeter Array (ALMA) international project. He has published around 40 papers covering planet formation and exoplanets based on observations of near infrared and millimeter/submillimeter wavelength. He recently won the Outstanding Young Scientist award 2016 from the Japanese Society of Planetary Science.

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