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■ Title

Studying the origins of exoplanet diversity and materials in our solar system and exoplanetary systems with ALMA observations of molecular lines

■ Summary

Discovery of exoplanets has revealed diversity of exoplanetary systems which requires a new paradigm of planet formation theory. Meanwhile, observations of detailed structure of protoplanetary disks have been recently developed very rapidly. Especially, ALMA observations with high spatial resolution and high sensitivity have made it possible to reveal gas and dust properties in planet-forming regions in the disks. In this work, first, we will develop the method, how to reproduce physical and chemical structure of the disks by comparing observations and model calculations of molecular lines. And then, by applying this method to various observations / archived data, we will reveal physical and chemical evolution, such as dust evolution, gas dispersal, locations of snow lines, and distribution of isotopologues in the disks, which will help our understandings of the origins of exoplanet diversity and materials in our solar system and exoplanetary systems.