KaVA ESTEMA and the Large Program on circumstellar masers

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KaVA/EAVN Large Programs on circumstellar masers

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Phase 1: KaVA ESTEMA (Extended Study on Stellar Masers) 2015 October — 2017 March

Snapshot imaging of H2O and SiO masers in circumstellar envelopes (Figure 1), around 80 stars. Using multi-frequency phase-referencing, composite maps will be produced (Figure 2). Image synthesis is ongoing (Figure 3), but we can find at least 15 stars suitable for the phase 2 project (Figure 4).

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Phase 2: new ESTEMA (EAVN Synthesis of Stellar Maser Animations) 2018 — 2027, ~450 hours/year

10 pulsating stars (P=306—1433 days) monitoring SiO and H2O masers in every 1/20 pulsation cycle over a few pulsation cycles for “stellar maser animation” synthesis. The new ESTEMA sessions will adopt the scan patterns (Figure 5), similar to those in KaVA ESTEMA. The time allocation model for the monitoring observations are considered (Figure 6) for realistic monitoring program for a decade. K-/Q-band simultaneous observations shall be conducted in the whole KaVA. Tianma, Nanshan, Sejong, and Nobeyama will be added dependent on available setup, season, and time allocation rule.