R09c High angular resolution imaging of millimeter recombination line toward the NGC 253 nuclear starburst

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We will present ALMA high angular resolution imaging observation results toward NGC 253. Previous works with radio interferometers have already resolved the nuclear starburst into more than several star-forming clumps having diverse properties. However, there is still room for improving estimation of physical properties of the clumps by high angular resolution imaging which lead closer look into their nature and origin.

A radio recombination line (H40α) and underlying continuum at 3 mm, which is presumably dominated by thermal bremsstrahlung, were observed. Both of them convey information about dense ionized gas produced by UV radiation from young massive stars. They little suffer from interstellar extinction, hence the observation is the optimal way to look into ionized gas at the heart of NGC 253 starburst.

Thanks to the high angular resolution, which corresponds with a spatial resolution well better than 10 pc, H40α emission is resolved into individual clumps as Ando et al. (2017) reported, and the peak positions show slight but significant offset from those of molecular emission lines. Electron temperature of the ionized gas clumps is estimated by 3-mm continuum to H40α line flux ratio, and it turns out that the value is still quite similar to those estimated in other galaxies by using the same approach.