

The superwind Wolf-Rayet galaxy Markarian 1259

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Abstract. We present results of our optical spectroscopic observations and ^{12}CO ($J=1-0$) mapping of the Wolf-Rayet starburst galaxy Markarian 1259 with a superwind activity. We find that both the ionized gas and the molecular gas are associated with the superwind.

The pole-on viewed superwind of the Wolf-Rayet galaxy Markarian 1259 is investigated both by optical spectroscopy and by ^{12}CO ($J=1-0$) mapping. The optical spectrum at the nuclear region shows a prominent Wolf-Rayet feature around 4650 Å, indicating the presence of 4100 WRL stars (Ohyama, Taniguchi & Terlevich 1997). We find that the shock-excited ionized gas is spatially extended over a ~ 2.3 kpc region, suggesting the presence of a superwind. The stronger [NII] emission indicates the over-abundance of nitrogen.

The ^{12}CO ($J=1-0$) emission is detected in the nuclear star-forming region and even in the off-nuclear regions (~ 2 kpc apart from the nucleus). Since the velocity field of the off-nuclear molecular gas cannot be explained by a model of a simple disk rotation, we suggest that the molecular gas is associated with the superwind (Ohyama & Taniguchi 1998). Our recent high-resolution ^{12}CO ($J=1-0$) map obtained with the Nobeyama Millimeter Array (NMA) of this galaxy, has shown clearly that there are three velocity components in the off-nuclear regions: a disk component at the systemic velocity and two high-velocity components (red-shifted and blue-shifted ones). This kind of velocity field is well represented by our simple model of pole-on biconical outflow in which the molecular gas is blowing off the nucleus (Ohyama & Taniguchi 1998, 1999).

References

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