Detection of the ^{29}SiO v=1, J=1-0 Maser from TX Camelopardalis

Cho, Se-Hyung
Korea Astronomy Observatory, Whaam, Yusong, Daejon305-348
Ukita, Nobuharu
Nobeyama Radio Observatory, Minamimaki, Minamisaku, Nagano 384-13, Japan

The maser emission from the v=1, J=1-0 transition of 29SiO has been detected for the first time toward the Mira variable star TX Cam among 54surveyed late-type stars. The line was fairly narrower than that of the 29SiO v=0, J=1-0 transition, and slightly redshifted compared to the v=0 line. In addition, the 28SiO v=2, J=2-1 transition has been also newly detected in this star. Based on the line intensity, the pumping mechanism for the 29SiO v=1, J=1-0 maser is discussed. The line overlap mechanism can not be directly adopted for the 29SiO line for TX Cam without testing the normal inversion mechanism. The simple Large Velocity Gradient (LVG)model for 29SiO can not be also adopted for TX Cam.

THE BLISTER-TYPE GALACTIC H II REGION G5.5-0.24: RADIO CONTINUUM, H I, AND CO OBSERVATIONS

BON-CHUL KOO, KEE-TAE KIM, AND HO-GYU LEE
Department of Astronomy Seoul National University

We have carried out VLA radio coninuum (6 and 20cm), VLA H I 21-cm line, and 13CO J=1-0 line observations of the galactic H II region G5.5-0.24. We present the continuum maps at 21 cm with ~ 50″ resolution and at 6 and 20 cm with ~ 5″ resolution. The radio continuum maps show that the H II region is composed of a bright component immersed in an extended (16′ x 11′), diffuse emission. The bright component has a compact (15″ x 11″) core surrounded by an extended (3′ x 2′) halo. The brightness of the diffuse emission decreases steeply along its western boundary and gradually at other directions. At a distance of 12.5 kpc, the observed radio continuum flux, half of which is contributed by the diffuse emission, requires an ionizing star of O5 ZAMS. The VLA H I 21-cm line maps show that there is an H I cloud in contact with the western boundary of the H II region. The 13CO line observations show that there is a giant molecular cloud associated with the H II region. The bright component of the radio continuum emission appears to be within the dense core of the molecular cloud.

The radio continuum morphology together with the associated H I and molecular clouds suggests that G5.5-0.24 belongs to the blister-type H II region. According to Wood & Churchwell, the radio continuum core has an ultracompact (~ 1.″4) subcomponent With n_e ~ 1 x 10^4 cm^{-3} . The large electron density of the ultracompact component and the location of the bright component
within the dense core of the molecular cloud suggest that the H II region is very young, ~1 x 10 yrs.