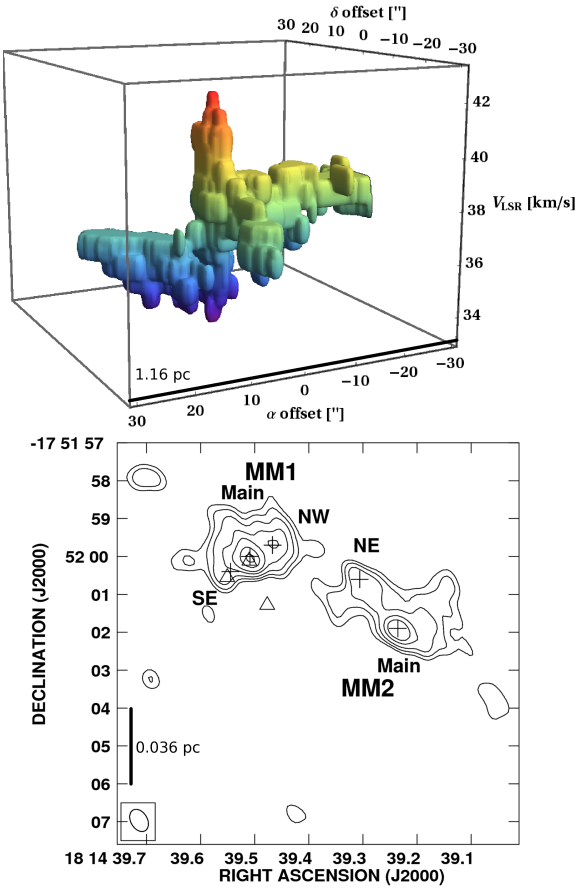

Fig. 1. Top: position-position-velocity rendering of the parsec-scale filaments observed in the NH_3 (2,2) data toward W33A. The two filamentary structures at different velocities do not merely superpose at the position center, but merge in position-position-velocity space, suggesting interaction of the filaments. Bottom: continuum at 231 GHz (1.3 mm) from the SMA Compact+VEX data at the intersection of the filaments shown in the top panel. The dusty star-forming cores are labeled.

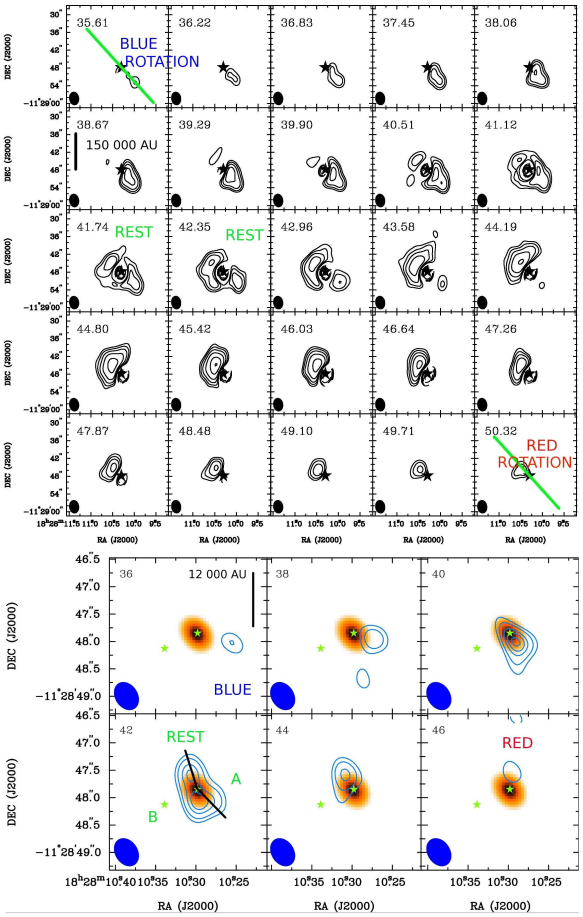

Fig. 2. Top: NH_3 (3,3) observations of the pc-scale emission. The star covers the three UC and HC H II regions mentioned in the text. Estimates of the gas mass ($M_{gas} \sim 2000\ M_\odot$, from molecular lines and dust) and stellar mass ($M_\star \approx 34\ M_\odot$, from the continuum SED) indicate that the velocity gradient is caused by rotation (a ≈2 km s^{-1} infall component is also detected from absorption). Bottom: warm gas emission traced by CH_3CN 12–11 (contours) around the HC H II region A (color). The rotation motions in the inner 0.1 pc are similar to those in the pc-scale flow.

& Churchwell (1989). We find a large-scale (radius ∼0.5 pc) accretion flow around and into a star cluster with several O-type stars, identified by one UC and two HC H II regions. This flow is rotating (Figure 2)and infalling towards its center. The two HC H II regions have infall toward them as inferred from subarcsecond resolution NH_3 observations. The brightest HC H II region (A) is detected in mm emission lines that trace warm molecular gas. This gas rotates in concordance with the large-scale flow (Figure 2). The presence of rotation and infall at both scales (∼0.5 pc and ∼0.05 pc), as well as the short dynamical time-scale of the small-scale flow, suggest that the small cores are still accreting from their environment. This result supports models of star formation initiated by global collapse of the parental cloud (Field et al. 2008; Vázquez-Semadeni et al. 2009; Wang et al. 2010; Peters et al. 2010).

REFERENCES

Field, G., et al. 2008, MNRAS, 385, 181
Galván-Madrid, R., et al. 2009, ApJ, 706, 1036
Galván-Madrid, R. et al. 2010, ApJ, 725, 17
Peters, T., et al. 2010, ApJ, 711, 101
Stier, M. T., et al. 1984, ApJ, 283, 573
Vázquez-Semadeni, E., et al. 2009, ApJ, 707, 1023
Wang, P., et al. 2010, ApJ, 709, 27
Wood, D. O. S., & Churchwell, E. 1989, ApJS, 69, 831