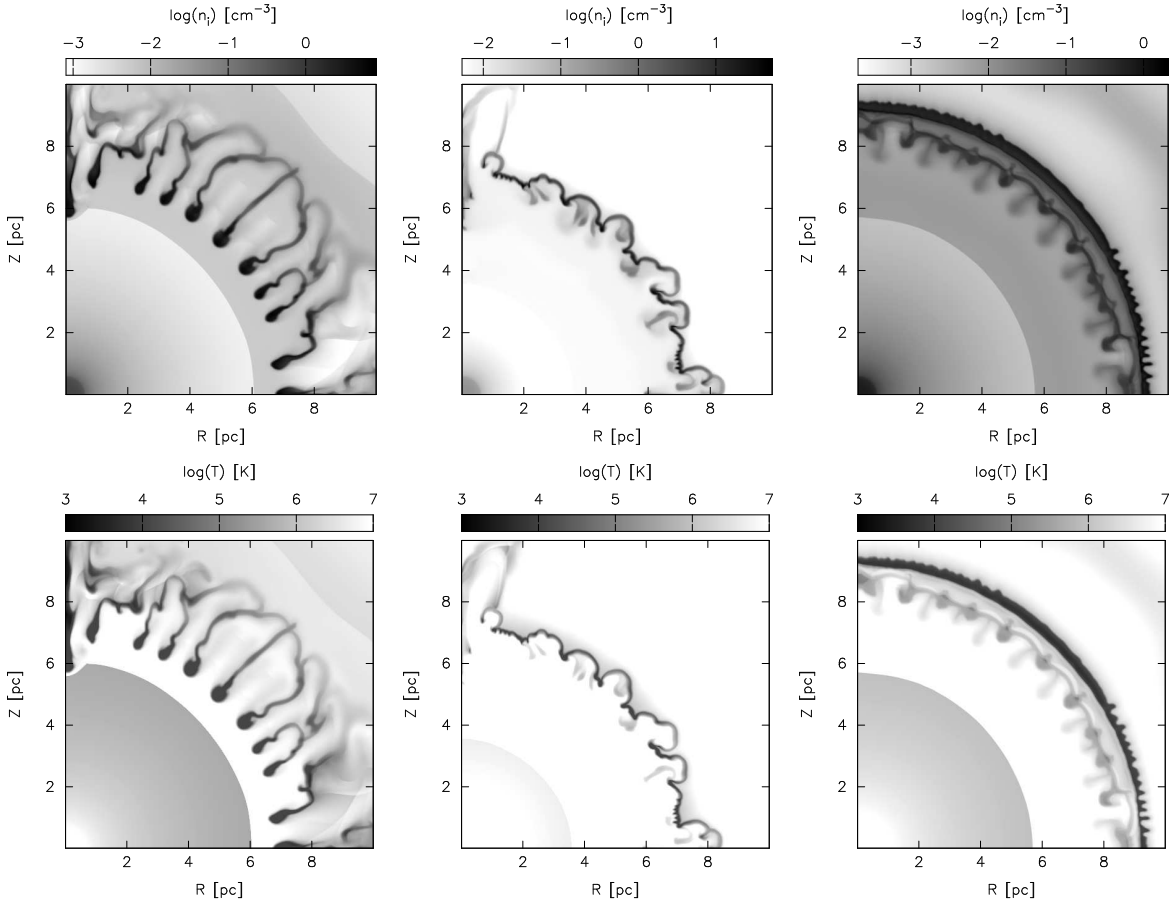


Fig. 1. Density and temperature during the interaction of the fast WR wind with the slow, dense RSG wind for the 40 $M_{\odot}$ STARS and MM2003 models. Top panels: ionized number density, bottom panels: temperature. Left: STARS model 151,600 yrs after the onset of the WR stage, middle: MM2003 model without rotation 33,250 yrs after the onset of the WR stage, and right: MM2003 model with rotation 15,080 yrs after the onset of the WR stage.

The structures resulting from the STARS model do not produce much gas at $T \sim 10^6$ K, and we obtain very low soft X-ray luminosities ($< 10^{32}$ erg s$^{-1}$). This could explain why RCW 58 was not detected by *XMM-Newton* (Gosset et al. 2005; Toalá & Arthur 2011). On the other hand, the MM2003 models produce structures morphologically similar to the WR bubbles S 308 and NGC 6888, with optical emission (photoionized gas) external to the hot, X-ray-emitting gas. The observationally derived soft (0.25–1.5 keV) X-ray luminosity for S 308 is $5\times10^{33}$ erg s$^{-1}$ (Toalá et al. 2011, in preparation), while that of NGC 6888 is $\sim3\times10^{34}$ erg s$^{-1}$ in the energy band 0.4–2.4 keV (Wrigge et al. 2005). Our MM2003 simulations lead to soft X-ray luminosities in the range $10^{33}$–$10^{34}$ erg s$^{-1}$ but only for a short period of time ($< 50,000$ yrs) while the wind-wind interaction is taking place.

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