Nucleosynthesis Ejecta in the Galaxy

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Massive star winds and supernova explosions arise from coeval groups of stars, and lead to super-bubbles up to kpc in size. Feedback and ejecta transfer kinetic energy and new nuclei in a complex way to the structured interstellar gas. Their kinematics is directly reflected in radioactive trace elements such as ^{26}Al. The Doppler-shifts seen in the ^{26}Al line show that the line-of-sight averaged velocities of gas traced by ^{26}Al are substantially larger than expected from Galactic rotation. An averaged bulk velocity of ~200 km s^{-1} above the Galactic-rotation velocity is surprising. We suggest that superbubbles preferentially expand in a non-symmetric way around their sources and towards the leading edges of spiral arms, thus producing a net asymmetry of the expansions of ^{26}Al enriched ejecta.

[1] K. Kretschmer et al., Astronomy & Astrophysics. 559, A99 (2013).