The Composition and Dynamics of Starburst-Driven Galactic Winds in Dwarf Galaxies

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Abstract

Starburst-driven winds are thought to play a prominent role in the chemical evolution of galaxies and the metal enrichment of the intergalactic medium. The coronal gas in the outflows may contain most of the metals recently ejected by supernovae. Such enrichment is conspicuously absent in the warm phase of the interstellar medium near young star clusters. Prior to Chandra, abundance measurements of the outflows were met with skepticism due to a number of degeneracies in the spectral fitting. The unprecedented spatial resolution of Chandra allows us to remove some of those degeneracies via spatial filtering of discrete spectral components. We will present results from a deep ACIS-S observation of NGC 1569. This nearby, dwarf galaxy is ideal for this type of measurement due to its proximity (10 pc resolution), low metallicity (thus larger dZ/Z from enrichment), low escape velocity, and prominent outflow. We will also use extensive optical and radio observations to discuss the dynamics of the outflow and the nature of the X-ray point sources in this galaxy. Comparisons with our new data for several other dwarf galaxies will be made to address the cosmological impact of dwarf galaxy winds.

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