

# Addendum: Large metallicity variations in the Galactic interstellar medium

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**Annalisa De Cia, Edward B. Jenkins, Andrew J. Fox, Cédric Ledoux, Tanita Ramburuth-Hurt, Christina Konstantopoulou, Patrick Petitjean & Jens-Kristian Krogager**

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In this Article, we stated that significant amounts of low-metallicity gas in the neutral interstellar medium (ISM) are needed to explain the observed abundance patterns. We clarify here that the exact amount of low-metallicity gas present along each line of sight is difficult to quantify because several assumptions are required to derive the gas mass from the column densities measured along the line of sight. The volatile elements often deviate from the linear fit to the more refractory elements in the abundance patterns (Extended Data Fig. 3 of the original Article). As suggested in the Article, this indicates that there must be a mixture of different gas types along many lines of sight. Near-solar metallicity gas could give rise to the volatile elements, while the low-metallicity nearly dust-free gas could dominate the abundance patterns of the refractory elements. The exact composition of this gas mixture is hard to determine. Our results favour the possibility that an amount between a few per cent and almost half of the gas has a low metallicity, but we cannot rule out a mixture of solar-metallicity gas having vastly different levels of depletion onto dust grains. These results do not contradict the observations that HII regions and OB stars show smaller scatter in metallicity, particularly if the mass contribution of the low-metallicity gas is small, and in general given that some of the neutral gas is in an extended phase of the ISM rather than tracing denser (and possibly more mixed) star-forming environments. Our results do show, however, that low-metallicity gas is present in the ISM, the mass of which is unconstrained so far. Our observations highlight the variety in chemical enrichment of the neutral ISM, both in terms of metallicity and dust depletion. A more complete analysis of the chemical properties of the ISM is under way.

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