

Sulfur in the globular clusters 47 Tuc and NGC 6752

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Abstract. The light elements Li, O, Na, Al, and Mg are known to show star-to-star variations in the globular clusters 47 Tuc and NGC 6752. We have investigated the behavior of the α element sulfur, for which no previous measurements exist in any Galactic globular cluster. We used high-resolution UVES spectra of Si multiplet 1 around 923 nm, and determined S abundances by means of ATLAS static plano-parallel models. NLTE corrections were applied and 3D corrections were also computed from CO5BOLD 3D hydrodynamical models. Sulfur has been measured in four subgiant stars in NGC 6752, leading to an average value of $[S/Fe] = +0.49 \pm 0.15$ dex, consistent with what is observed in field stars of similar metallicity. In 47 Tuc, we measured S in four turnoff (TO) and five subgiant (SG) stars, for an average value of $[S/Fe] = 0.18 \pm 0.14$ dex. While the measurement errors are consistent with a constant value among all cluster stars analyzed, we detected a highly significant correlation with sodium abundance, as well as a tentative one with silicon. The sulfur–sodium correlation is difficult to explain in terms of nucleosynthesis. Given its high statistical significance, it is also difficult to dismiss it as fortuitous. Until better data for more stars are available, the question as to its origin remains open.

Keywords. stars: abundances, globular clusters: individual (47 Tuc, NGC 6752)

The full poster (in pdf format) is available at
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