Discovery of iron in PG1159 stars

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Up to now, iron was not found in any PG1159 star, despite intense search in a number of objects. Consequently, an iron-deficiency was claimed, in some cases at least one dex. Primary indicators were UV lines of Fe VII. Therefore the search was confined to relatively cool PG1159 stars ($T_{\rm eff} \lesssim 150\,000$ K) otherwise Fe is too strongly ionized for a significant population of Fe VII.

We have now detected Fe X lines in FUSE spectra of the very hottest PG1159 stars ($T_{\rm eff} = 150\,000$ – $200\,000$ K; RX J2117.1+3412, K 1−16, NGC 246, Longmore 4). Surprisingly, we derive a solar iron abundance. It is conspicuous that they are among the most massive PG1159 stars (0.71 – 0.82 $M_\odot$), in contrast to those objects for which strongest Fe-deficiency was claimed (0.53 – 0.56 $M_\odot$).

Based on new Fe VIII line identifications in SOHO/SUMER UV spectra of the Sun, we were able to detect these lines in FUSE spectra of several "cooler" ($T_{\rm eff} \lesssim 150\,000$) objects, among them is the prototype PG 1159−035. An abundance analysis is in progress.