B T2 First signatures of strong differential rotation in A-type stars

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We reanalyzed high quality spectra of 158 stars of spectral types A0-F1 and $v \sin i$ between 60 and 150 $\mathrm{km\,s^{-1}}$. Using a Least Squares Deconvolution technique we extracted high S/N broadening profiles and determined the loci of the Fourier transform zeros q_1 and q_2 where the S/N-ratio was high enough. The values of $v \sin i$ were redetermined and found to be consistent with the values derived by Royer et al. (2002). For 78 stars q_2 could be determined and the ratio q_2/q_1 was used as a shape parameter sensitive for solar-like differential rotation (Equator faster than Pole). 74 of the 78 stars have values of q_2/q_1 consistent with solid body rotation; in four of the 78 cases, values of q_2/q_1 are not consistent with rigid rotation. Although these stars may be binaries, none of the profiles shows signatures of a companion. The Fourier transforms do not indicate any distortions and the broadening profiles can be considered due to single objects. One of those candidates may be an extremely rapid rotator seen pole-on, but for the other three stars of spectral types as early as A6, differential rotation seems to be the most plausible explanation for the peculiar profiles.