Fourier method in the determination of rotational velocities in OB stars

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We present a comprehensive study that applies the Fourier transform to a sample of O and early B-type stars (either dwarfs, giants, or supergiants) to determine their projected rotational velocities, compare with previous values obtained with other methods, and seek for evidence of extra broadening in the spectral lines
The Fourier technique, extensively used in the study of cooler stars, has remained only marginally applied for the case of early-type stars. The comparison of vsini values obtained through the ft and fwhm methods shows that the fwhm technique must be used with care in the analysis of OB giants and supergiants, and when it is applied to ion{He}{i} lines. Contrarily, the ft method appears to be a powerful tool to derive reliable projected rotational velocities, and separate the effect of rotation from other broadening mechanisms present in these stars.
The analysis of the sample of OB stars shows that while dwarfs and giants display a broad range of projected rotational velocities, from less than 30 up to 450 kms, supergiants have in general values close to or below 100 kms. The analysis has also definitely shown that while the effect of extra broadening is negligible in OB dwarfs, it is clearly present in supergiants. When examining the behavior of the projected rotational velocities with the stellar parameters and across the HR diagram, we conclude, in agreement with previous researchers, that the rotational velocity should decrease when the stars evolve. On the contrary, macroturbulence may be constant, resulting therefore in an increasing importance as compared to rotation when the stars evolve.

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