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New advances in asteroseismology of pulsating hot subdwarf stars

S. Charpinet[1], V. Van Grootel[1], S.K. Randall[2], E.M. Green[3], G. Fontaine[4], P. Brassard[4] and P. Chayer[5]

[1]Laboratoire d'Astrophysique de Toulouse-Tarbes, Université de Toulouse, CNRS, 14 av. E. Belin, 31400 Toulouse, France
email: scharpin@ast.obs-mip.fr

[2]ESO, Karl-Schwarzschild-Str. 2, 85748 Garching bei München, Germany

[3]Steward Observatory, University of Arizona, 933 North Cherry Ave., Tucson, AZ 85721

[4]Université de Montréal, C.P. 6128, Succ. Centre-Ville, Montréal, QC H3C 3J7, Canada

[5]Space Telescope Science Institute, 3700 San Martin Drive, Baltimore, MD 21218, USA

Abstract. Hot subdwarf stars (of the sdB and sdO type) host three known classes of nonradial pulsators. Two of them feature short period ($P \sim 60 - 600$ s) accoustic mode oscillations, while the third group is characterized by slow g-mode deformations with periods of $\sim 1 - 2$h. These pulsations offer favorable grounds to infer some of the internal properties of these objects through asteroseismology. This has been exploited for the rapid p-mode sdB pulsators and the present contribution reviews some of the recent advances in this field. The long period g-mode pulsators, whose vibrations probe much deeper inside the star, are also of high interest. With the advent of space observations using CoRoT and KEPLER, the asteroseismology of these slower oscillators will also become a possibility, and likely contribute to significant breakthroughs in our understanding of these hot and compact stars.

Keywords. stars:subdwarfs; stars:oscillations; stars:interiors; stars:rotation

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Quantitative asteroseismic studies of hot B subdwarf stars have been effective for several years, following the pioneering work of Brassard et al. (2001). The rapid, *p*-mode sdB pulsators, also known as the EC14026 or V361 Hya stars, proved to be particularly suitable for that purpose. These stars pulsate in low-order, low-degree accoustic modes with periods typically in the range 80 – 600 s. For 12 such stars (out of 42 known), asteroseismic solutions could be derived providing accurate determinations of the main structural parameters: the mass, H-rich envelope mass, surface gravity, effective temperature, radius, absolute magnitude, and distance. For two objects, Feige 48 (Van Grootel *et al.*, 2008) and PG 1336–018 (Charpinet *et al.* 2008), information on the internal rotation could also be obtained. Such advances open up many opportunities to study this phase of stellar evolution as well as key physical process that influence the structure and evolution of stars in general (more can be found in the review paper of Charpinet *et al.* 2009).

References

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