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Asteroseismology of solar-like type stars: the era of the spaceborne instruments CoRoT and Kepler

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We discover every day new exoplanets around distant stars. Some of them may have similar sizes and masses than earth and may even be in the habitable zone. However, measure of such exoplanets properties requires a precise characterisation of their host stars.

Stars are mainly the result of equilibrium between two forces: the gravity that tend to contract them and of the pressure that tend to expand them. The stellar plasma is in continuous contraction and dilatation, inducing tiny pulsations and thus, luminosity fluctuations. The asteroseismology, the science that study these pulsations, enables us to model the internal structure of stars using their oscillation mode frequencies. This approach, can achieve precision of only few percent on the stellar mass and radius (an order of magnitude better than classical constrains), which in turns allows us to better constrain the mass and radius of exoplanets (e.g. Grigahcene et al. 2013, Gizon et al. 2013).

Here, I will present how asteroseismology is improving our knowledge of the different stage of stellar evolution of solar-type stars as well as how seismic constrains help us to better characterise the exoplanets. This will be illustrated by using examples from data of the CoRoT (CNES, France) and Kepler (NASA, USA) space-borne instruments.