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Solar-like Stars: Seismology and Stellar Magnetic Activity

Thursday, January 23, 2025 11:15 AM (25 minutes)

Helio- and astero-seismology allow us to extract information on the structure and dynamics of the Sun and stars from the surface to the deeper layers.

Magnetic activity affects the properties of the acoustic modes: at maximum magnetic activity the frequencies of the modes increase while the amplitudes of the modes decrease. This was first observed for the Sun and was applied to many more solar-like stars observed by space missions such as CoRoT and Kepler. By combining these observables with the internal structure from asteroseismic models, we can obtain a broader picture of how magnetic activity operates in stars. Thanks to the larger sample stars observed by space missions, we can study how magnetic activity evolves with different stellar parameters and with time. This also means that p-mode amplitudes are suppressed for very active stars preventing us from detecting them. For those more active stars, surface magnetism can be measured with photometric data, increasing the sample to several tens of thousands of stars. With this enlarged sample we can study the evolution of magnetic activity with age and Rossby number.

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Session Classification: Asteroseismology