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## Monitoring of an irrigated olive orchard using C-band backscattering coefficient and interferometric coherence at high temporal frequency: preliminary results

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In the south Mediterranean region already facing water scarcity, up to 80% of available water is used by irrigated agriculture. This work focuses on the analysis of the C-band response of a tree crop with in situ data acquired with a time step of 15 mins in the final objective of developing water stress detection approaches based on radar data. Focus is put on the daily cycle of the radar-backscattering coefficient and of the interferometric coherence. The site is located in the Chichaoua region (Morocco) was equipped in May 2019 with 6 C-band radar antennas installed on a 20 m tower. In parallel, automatic acquisitions at a half hourly time step of latent and sensible heat fluxes, sapflow, soil moisture and temperature profile together with manual measurements of LAI, soil roughness and above ground biomass every 15 days were carried out. The preliminary results show a strong daily cycle of the interferometric coherence with a significant drop of the coherence during daytime. The coherence loss at dawn occurred concurrently with the start of the sapflow while minimum values were observed in the afternoon when wind speed is maximum. A significant daily cycle of the backscattering coefficient is also prominent. The amplitude of the daily cycle decreased from the dormancy period in winter from up to 2dB to less than 1dB in summer when physiologic activity of the trees is at its maximum. These first results open perspectives for the monitoring of the hydric status of crops within the frame of future radar missions in geostationary orbit.