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# Exoplanets characterization with ELT/HARMONI

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## Résumé

HARMONI is the 1st-light NIR integral field spectrograph of the ELT, providing spectral resolutions ranging from 3000 to 17000. A high-contrast imaging subsystem will allow HARMONI to spectrally characterize the atmospheres of young giant planets around nearby stars as close 1-3 AU. It will use pupil apodizers, focal plane masks, and a dedicated Zernike wavefront sensor to enable the observation of planets down to  $\sim 50$ mas in H- and K-band with a contrast down to  $\sim 1e-6$  and maybe lower. Both ADI and molecular-mapping algorithms will be used to process the data. Using the spectral diversity of the stellar and planet light could bypass the speckle noise limit, and might enable the observation of planets in reflected light. End-to-end simulations of typical observing sequences have been used to estimate its performance in various conditions, both to provide detection limits and to guide in the design of the subsystem. Following its final design review in 2024-2025, its integration will occur in 2025-2027.

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