

# Apodized Lyot coronagraph for SPHERE/VLT

## I. Detailed numerical study

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**Abstract** SPHERE (which stands for Spectro-Polarimetric High-contrast Exoplanet REsearch) is a second-generation Very Large Telescope (VLT) instrument dedicated to high-contrast direct imaging of exoplanets which first-light is scheduled for 2011. Within this complex instrument one of the central components is the apodized Lyot coronagraph (ALC). The present paper reports on the most interesting aspects and results of the whole numerical study made during the design of the ALC for SPHERE/VLT. The method followed for this study is purely numerical, but with an end-to-end approach which is largely fed by a number of instrumental feedbacks. The results obtained and presented in this paper firstly permit to finalize the optical design before

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