

hyper-Gaussian Lyot stops. These stops also improve the results of standard hard-edged Lyot stop.

We combined the different masks and stops and found that all of them outperform the standard coronagraph. In particular, the best results were obtained for hyper-Gaussian coronagraphic mask and Lyot stop. However, this filter combination leads to the attenuation of the companion intensity. A balance between detection angular separation reduction and companion intensity attenuation can be reached using adaptive mask and stop.

Finally, it can be seen from the contrast profiles that the reduction of the detection angular separation is more relevant for fainter companions since in these cases the condition $\text{SNR}_{\text{CS}} > 5$ takes place far from the star.

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