Probing the Size Distribution of the Kuiper Belt by Stellar Occultations

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We present the results of a serendipitous occultation observation campaign carried out with ULTRACAM, mounted on the ESO-VLT telescope, during 17-20th May 2005. The data are processed using the VI (Variability Index) method (Roques et. al 2006). The two-color dataset and the VI method allow a determination of size and the distance of the occulting object. We did not find any trans-neptunian objects larger than 200 meters radius, in the classical Kuiper belt (30-50 UA), within a data set of ~32 star-hours with a SNR>50. We performed successful detections of simulated objects' profiles, which validates the relevance of our data analysis for such a research. This result, together with the result of Roques et al., provides new constraints on the size distribution of objects within the classical Kuiper Belt. The data also provide constraints on an extended cold Kuiper disk of small objects: the number of objects larger than 300 meters radius is around 6.10^{12}: one Moon's mass.