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Photometry and spectroscopy of 67P/Churyumov-Gerasimenko at large heliocentric distance

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ESA's Rosetta mission will rendezvous with the Jupiter family comet 67P/Churyumov-Gerasimenko in 2014. Rosetta is the first spacecraft to orbit a comet nucleus and to travel with it in its journey towards perihelion, examining how a frozen comet is transformed by the solar heating and space weathering. Here we present some results from visible imaging and spectroscopy of 67P observed at the ESO Very Large Telescope in June 2004 and May/June 2006, when the comet was at large heliocentric distance. On May/June 2006 the full rotational light curve was obtained in the R filter and the rotational period of about 12.8 h has been determined. We also estimate the shape and size of the comet's nucleus, together with colors and the slope of the reflectance spectra. The comet has an effective radius of about 2.3 km and a lower limit for the axis ratio of 1.33 +/- 0.03. The nucleus results to be slightly redder than the Sun, result in agreement with the one obtained from the spectra of the comet, which show a reddening of about 10%/100 nm. The nucleus of the comet appears brighter than expected and its profile differs from the ones of a point source, indicating the presence of a coma around the nucleus.