

GRAVITY – Reaching out to SgrA* with VLTI.

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Abstract

As one of the 2nd generation of interferometric instruments in VLTI, GRAVITY was installed at the end of 2015 and has been observing the Galactic Center since May 2016. With the goal to reach an accuracy of tens of micro arcseconds, it is able to perform the most precise astrometric measurement of SgrA* to date. For that purpose, GRAVITY combines the light collected (coherently) from all the 8 m UTs or the four 1.8 m ATs providing infrared wavefront sensing to control the telescope adaptive optics, two interferometric beam combiners (one for fringe-tracking and one for the science object), an acquisition camera and various laser guiding systems for beam stabilization, as well as a dedicated laser metrology to trace the optical path length differences for narrow angle astrometry. Operating in K band with an active stabilization of the science channel, GRAVITY is able to increase the typical integration time from a few milliseconds (the typical atmospheric coherence time) to minutes, which implies a big leap in sensitivity allowing to observe fainter objects (K=19 in science detector) with the power of a 130m baseline interferometer, as it is the close environment of the supermassive black hole located in the center of our Galaxy. (See poster).