Talk at Splinter Meeting

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Explaining the Dusty S-cluster object (DSO/G2) using an accreting young star model

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The monitoring of the Dusty S-cluster object (DSO/G2) during its closest approach to the Galactic Center supermassive black hole in 2014 with ESO VLT/SINFONI revealed ionized-hydrogen emission from the DSO that remains spatially compact before and after the peribothron passage (Valencia-S., M. et al., 2015). The detection of DSO/G2 object as a compact single-peak emission line source is in contradiction with the original hypothesis of a core-less gas and dust cloud (Gillessen et al., 2012) that is necessarily tidally stretched near the supermassive black hole, which should lead to the appearance of double-peak emission line profile around the pericentre passage. Therefore the observed compact emission of the DSO (both line and continuum) strengthens the evidence that this infrared-excess source is a dust-enshrouded star (Eckart et al., 2013; Zajaček et al., 2014). The near-infrared observations put constraints on the SED and the bolometric luminosity of the DSO. The comparison with the stellar evolutionary and radiative transfer models shows that the observed properties can be explained by a young star that is still in the accretion phase of its evolution. The accretion of material from the circumstellar disc onto the stellar surface can contribute significantly to the emission of Brγ line as well as to the observed large line width of the order of 10 angstrom.