Vega - the Herschel view

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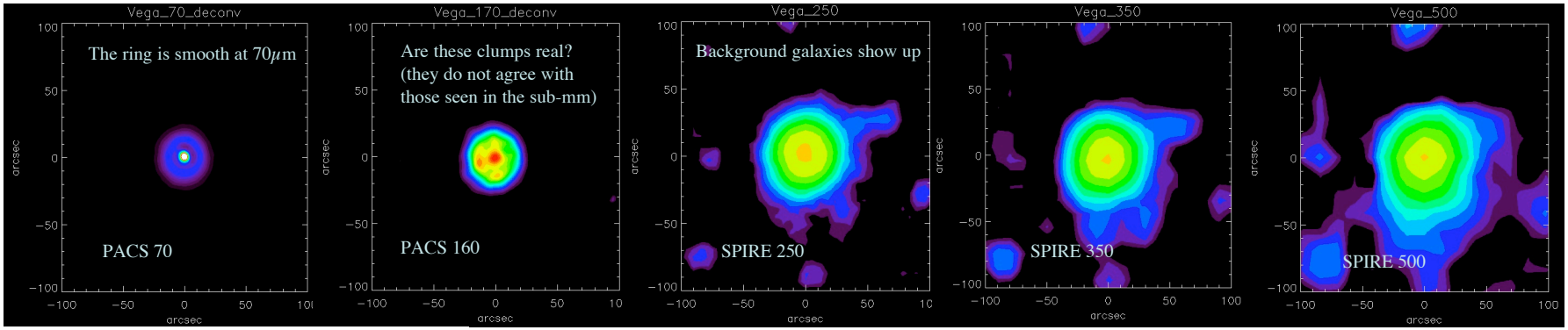
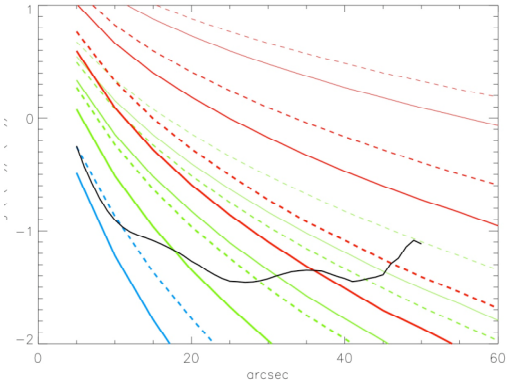
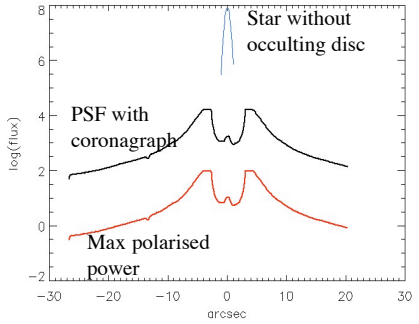
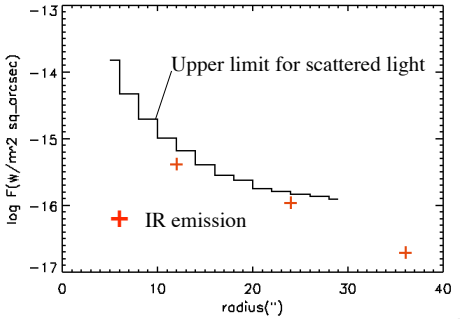




Both Spitzer at 24μm and PACS at 70μm resolve the disc and the corresponding colour index does not vary by much as a function of distance to the star. This means that the dust grains closest to the star are larger than those further away. In the figure to the left, the full drawn lines represent an optical absorption efficiency, Q_{abs}= 0.9, and the dashed lines Q_{abs}= 0.5. The emissivity is assumed to have the functional form $\varepsilon = (\lambda_0/\lambda)^{\beta}$, where λ_0 depends on the dust size distribution. We include three values for β, namely β = 0 (corresponding to blackbody emission), β = 0.5 and β = 1, represented by blue, green and red respectively. Also for λ_0 we assume three different values (1, 5 and 25 μm) roughly corresponding to grain diameters around a factor 10 smaller (depending on the optical properties of the grains).



Using the polarising coronagraph, PolCor, at the Nordic 2.5 m telescope on La Palma we failed to detect the disc around Vega. However, the upper limit of polarisation can be used to estimate the upper limit of the scattered light. Thus, assuming a high degree of polarisation (50%, which should be realistic due to the favourable scattering angle) we determine the upper limit shown on the figure to the right. This upper limit is close to the IR emission and this puts a limit to the optical albedo (< 60% for small particles).



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