1 INTRODUCTION

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ALTHOUGH I HAVE PUT THIS AS INTRODUCTION, YOU MIGHT FEEL IT WOULD BE BETTER IN THE DISCUSSION SECTION.

The location on the sky of HST 10 (182-413) is halfway between the inner Trapezium cluster and the Bright Bar region (see Fig. 1), at an angular separation of roughly 1′ to the south-south-east from θ^1 Ori C (O7V), the principal illuminating star of the nebula. Kinematic studies of the emission from the proplyd (Henney & O'Dell 1999) suggest that it is situated in the foreground of the nebula, with a true separation from θ^1 Ori C of 0.2–0.3 pc. The proplyd is larger and fainter than the proplyds found close to the Trapezium, with a less elongated and less symmetric tail. This is in line with the general trends seen in the proplyds (Bally et al. 1998; O'Dell 1998), which can be understood in terms of a model whereby protostellar disks around the young low-mass stars in the nebula are evaporated by the ultraviolet radiation from the high-mass stars (Johnstone et al. 1998; Henney & Arthur 1998).

Unlike in many of the smaller, brighter proplyds, the circumstellar disk is clearly visible in HST 10. In most emission lines, it is seen in absorption, but it is seen in emission in the H_2 2.12μm line (Chen et al. 1998) and in the [O I] 6300 Å line (Bally et al. 1998). The [O I] emission is shown in red in the right panel of our Figure 1, and the emission from the disk surface is believed to arise from the photodissociation of OH at the base of the neutral evaporated flow (Storzer & Hollenbach 1998). There is also a faint high-velocity microjet detected in [O I] (Henney & O'Dell 1999), which extends perpendicular to the disk (Bally et al. 2000).

Although the proplyds close to the Trapezium tend to be very symmetric about the line that joins them to θ^1 Ori C, this is not so true of HST 10, which seems to be governed by two different axes. The rotational axis of the disk and jet is oriented north-south, while the direction to θ^1 Ori C is at roughly 30° to this, at a position angle of 330°. This produces considerable distortion in the shape of the proplyd, with the tail, in particular, seemingly more governed by the jet axis than the ionizing radiation field.

The Orion Nebula is highly structured at all scales and many previously studied nebular features pass through or near the immediate vicinity of HST 10, as illustrated in Figure 1. The shadow rays (O'Dell 2000), are low-ionization, strictly linear features, which are seen outside the positions of some of the brighter proplyds, and are exactly aligned with the outer projection of the line joining θ^1 Ori C and the proplyd (see Fig. 2 of O'Dell et al. 2009). Three such rays are indicated in the Figure: the two most prominent, which are cast by 177-341 (HST 1) and 159-350 (HST 3), plus a much fainter one, which is cast by 170-337 and which passes within 2″ of HST 10 in projection. Unlike HST 10, 170-337 shows evidence of being located behind the Trapezium stars (Henney & O'Dell 1999), and therefore its shadow must be also, so it is very unlikely to be physically close to HST 10. The bar features are another type of linear structure that is very common in the nebula (O'Dell & Yusef-Zadeh 2000), of which the Bright Bar is the most prominent example. These are regions where the line of sight is tangential to a local ionization front, but the exact geometry is unclear in many cases. García-Díaz & Henney (2007) found that some faint compact bars are associated with dark lanes that are seen as linear extinction features in red-shifted velocity channels. Such is the case for the jagged low ionization filaments that cross the field of HST 10, as shown in the right panel of Figure 1. This type of emission feature may represent the ionized skin of a dense molecular filament that is protruding into the H II region, in which case it is likely to be close to the principal ionization front in the background of the nebula. So again, the line of sight position of the feature is probably far from HST 10.

Yet another type of linear structure is the high velocity collimated jets that drive the Herbig-Haro bowshocks seen in the nebula. The driving jet of the HH 203 bowshock (Doi et al. 2004) passes within 5″ of HST 10, although it is just outside the field of view of our VLT observations. A much larger scale kinematic feature is the so-called Big Arc (Doi et al. 2004; García-Díaz & Henney 2007), which is a blue-shifted high-ionization feature that extends over several arcminutes and whose origin is unclear. Again, although HST 10 is very close to the northern boundary of this feature, it probably does not affect our observations.

2 PHOTOEVAPORATION MODELS OF HST 10

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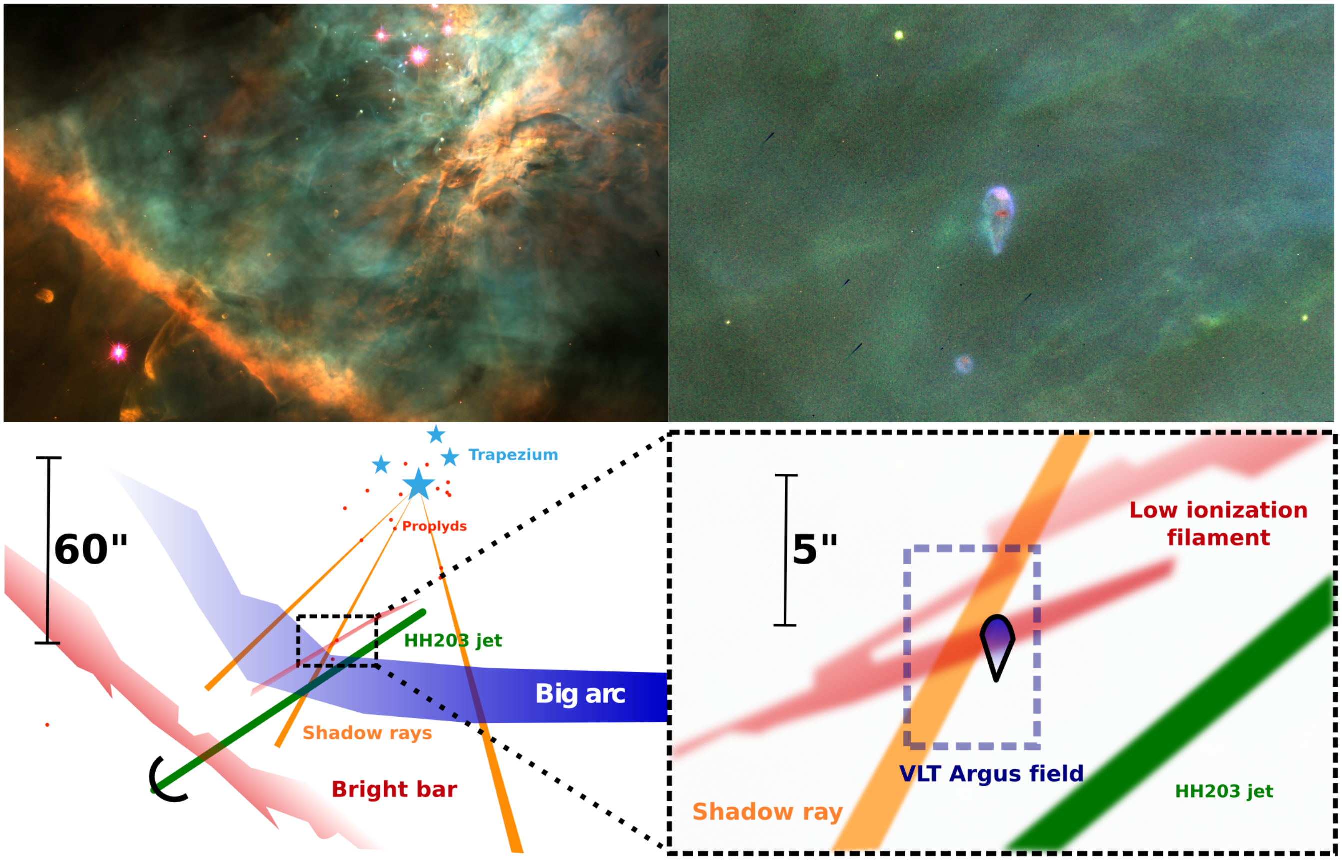

Figure 1. Left panels: Large-scale view of HST 10 in the context of the Orion Nebula. Three-color image in the filters of [N II] (red), Hα (green), and [O III] (blue), based on a mosaic of *HST* WFC observations descibed in O'Dell & Wong (1996). Right panels: Zoomed view of HST 10 and its immediate environs. Three-color image in the filters of [O I] (red), [S II] (green), and [N II] (blue), based on *HST* PC observations described in O'Dell (1998). The labelled objects are described in the test.

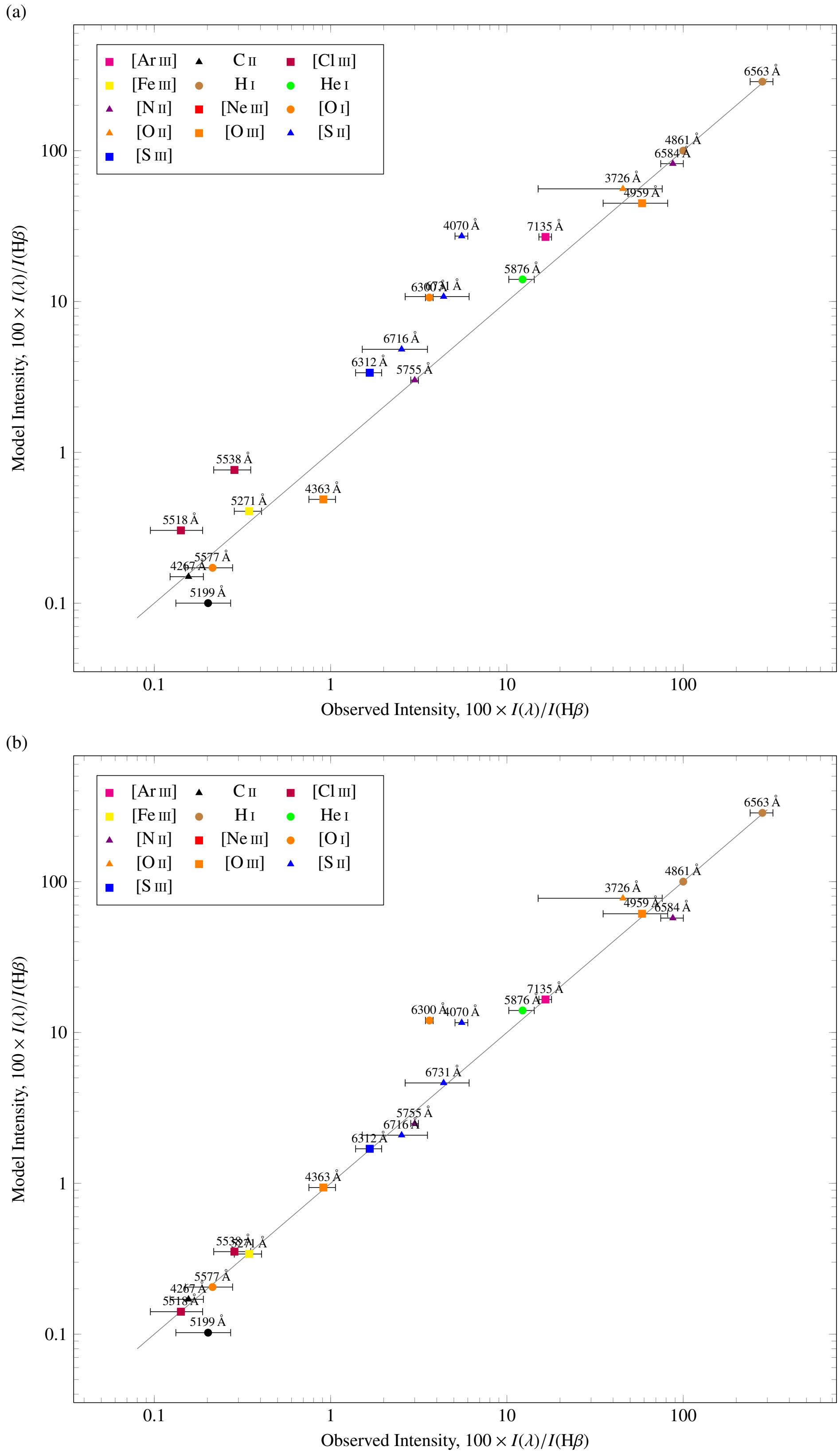

Figure 2. Comparison between predicted and observed emission line fluxes for photoevaporation models of HST 10 with (a) abundances as determined for the Orion Nebula by Esteban et al. (2004)