

2D He⁺ Pickup Ion Velocity Distribution Functions: STEREO/PLASTIC Results

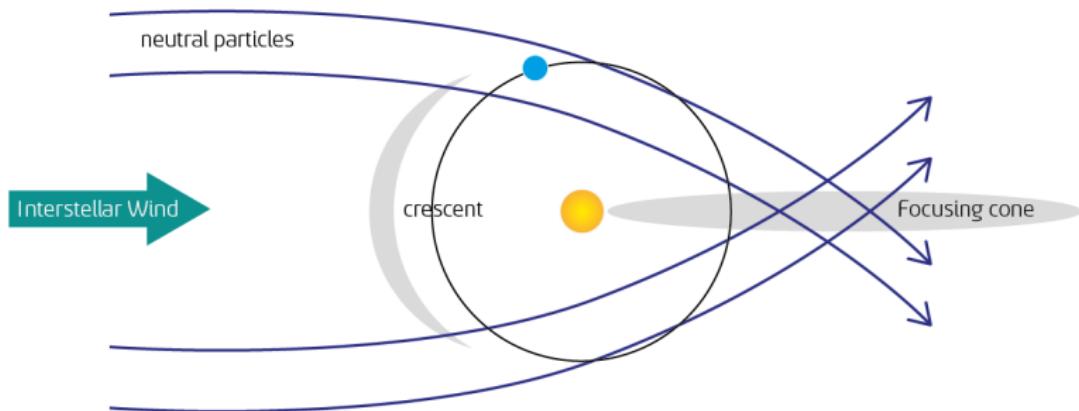
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Dec. 16, 2014

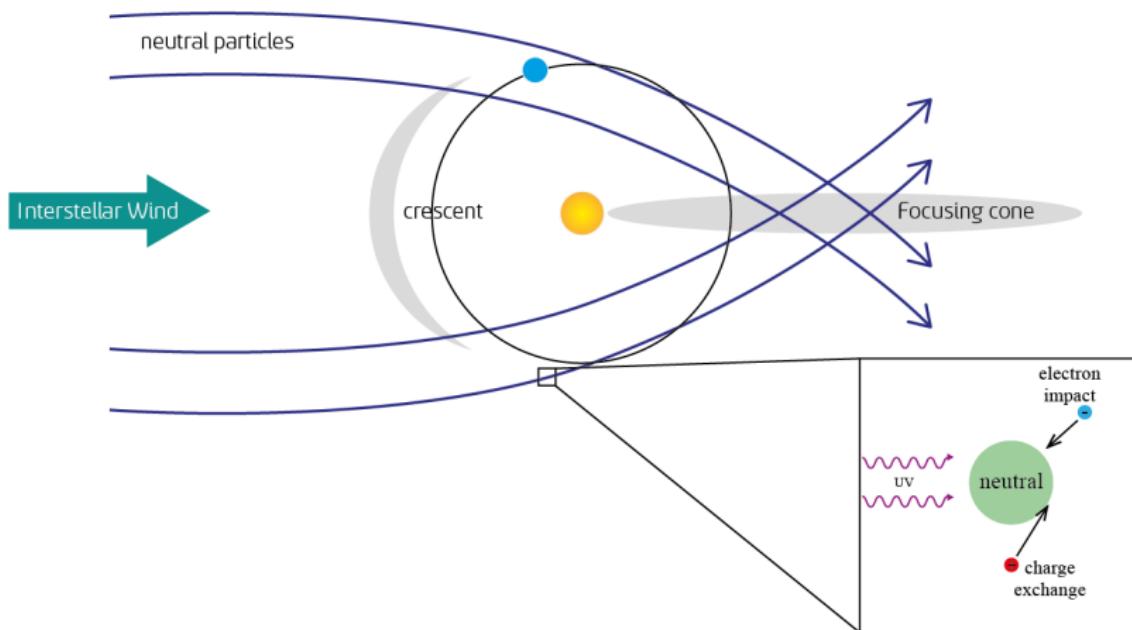
AGU Fall Meeting

Interstellar Pickup Ions

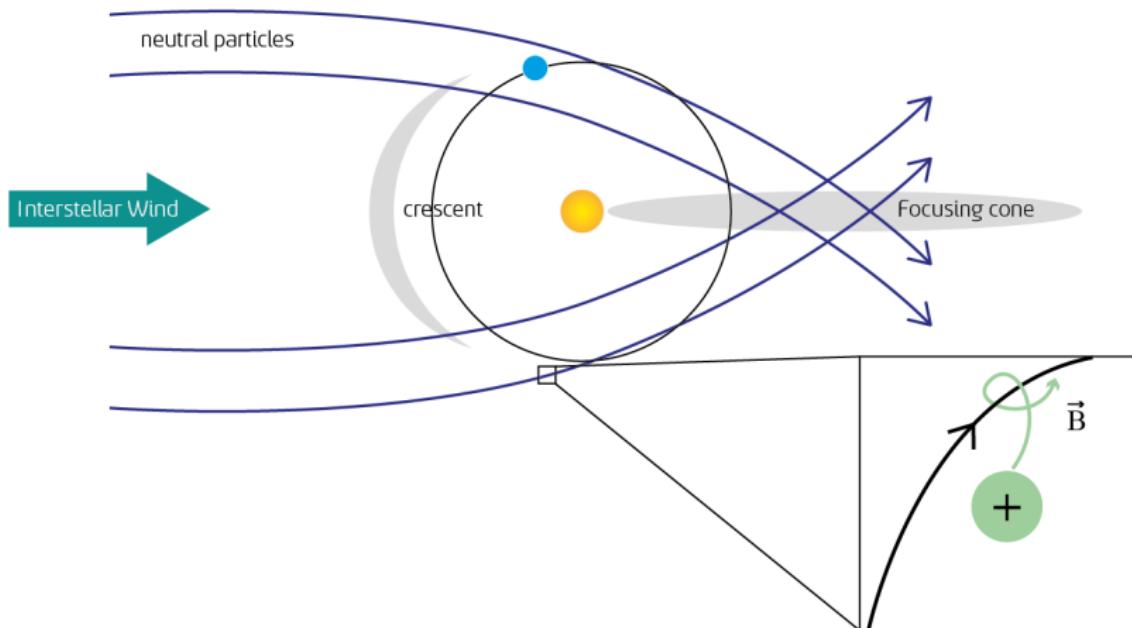


- ▶ neutrals originating from LISM
- ▶ low velocity of 22-45 km/s

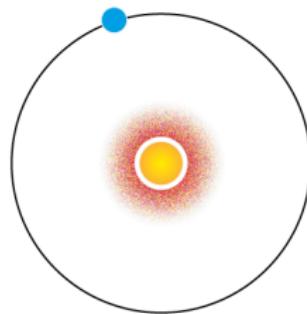
Interstellar Pickup Ions



Interstellar Pickup Ions

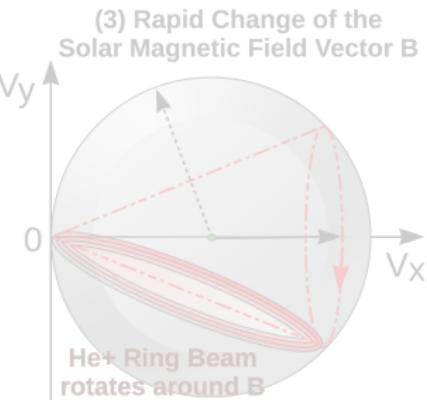
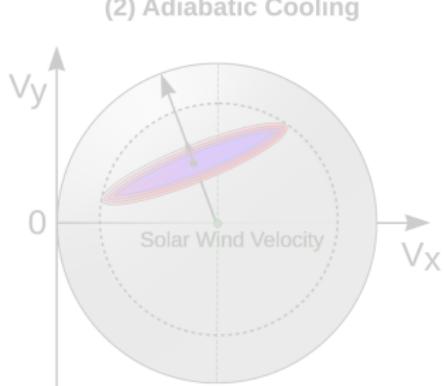
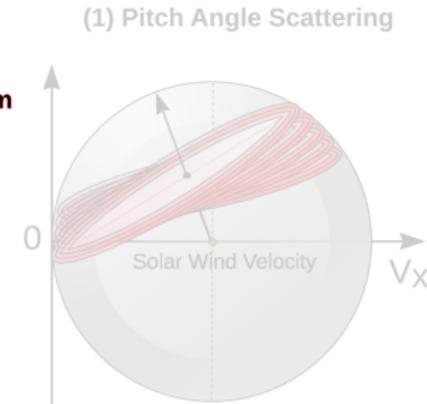
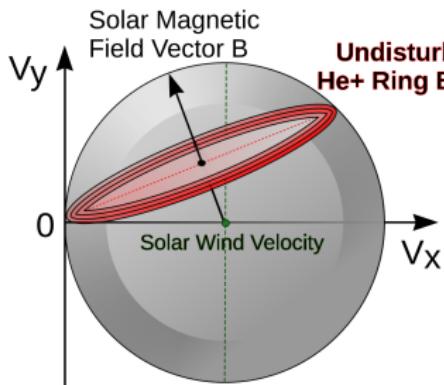


Inner-source Pickup Ions

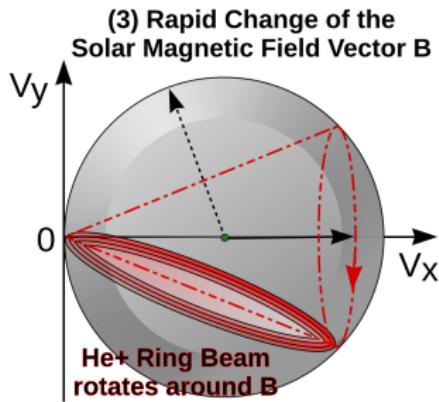
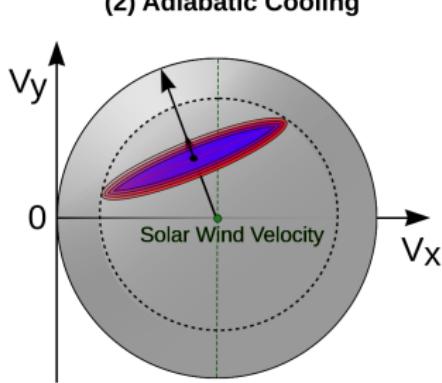
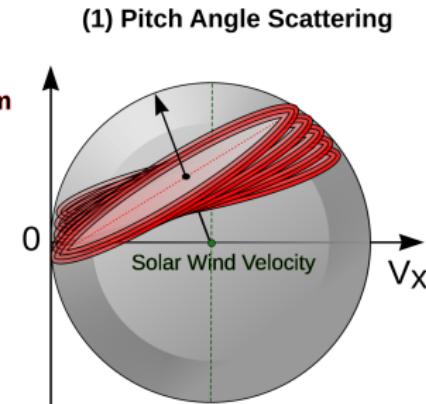
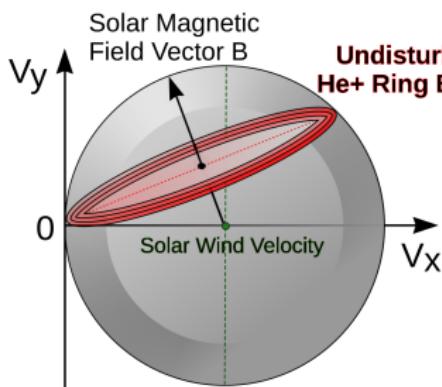


- ▶ observation of C^+
- ▶ VDF centered around v_{sw}
- ▶ most probably produced by solar wind-dust interaction

PUI Injection

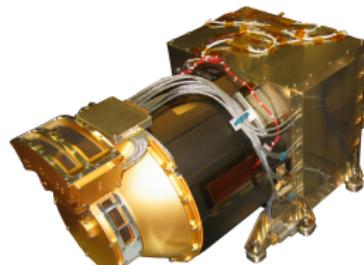
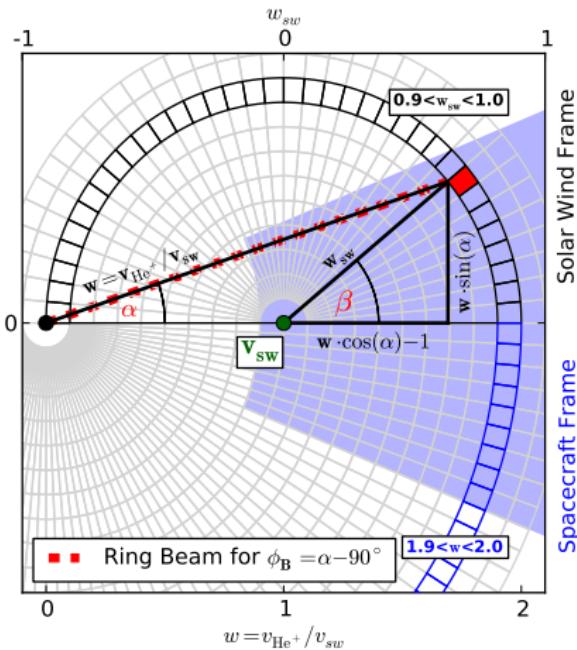


Processing of the VDF



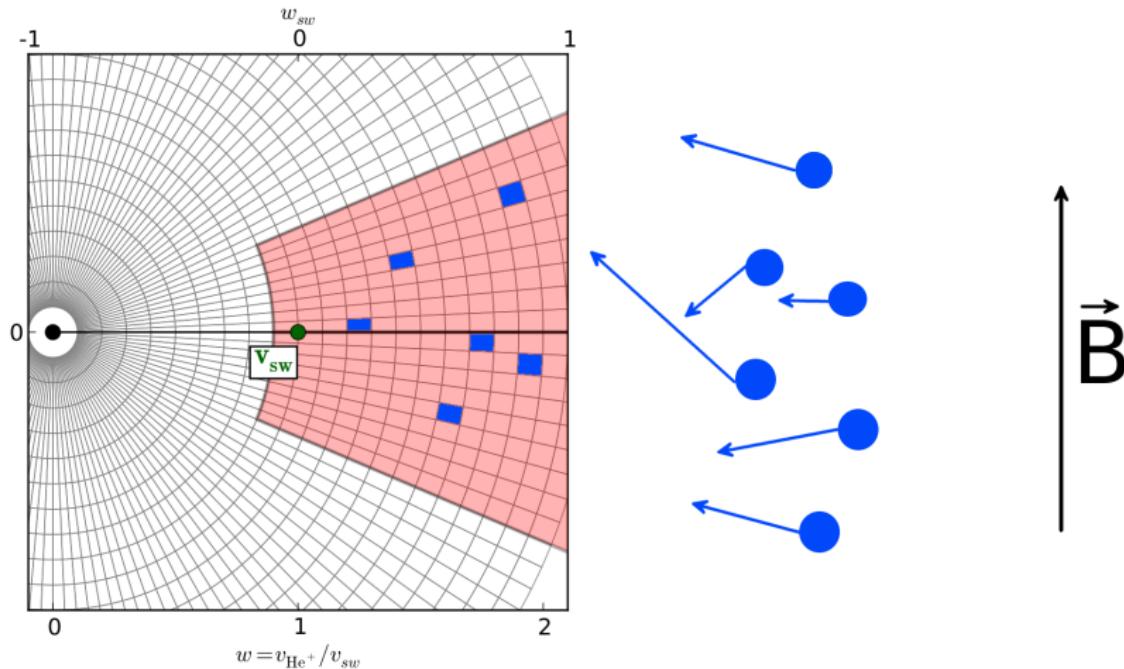
STEREO/PLASTIC

- ▶ Identification of He^+ by $\frac{m}{q}$
- ▶ Restrict to \vec{B} in the ecliptic $\pm 10^\circ$ (IMPACT)



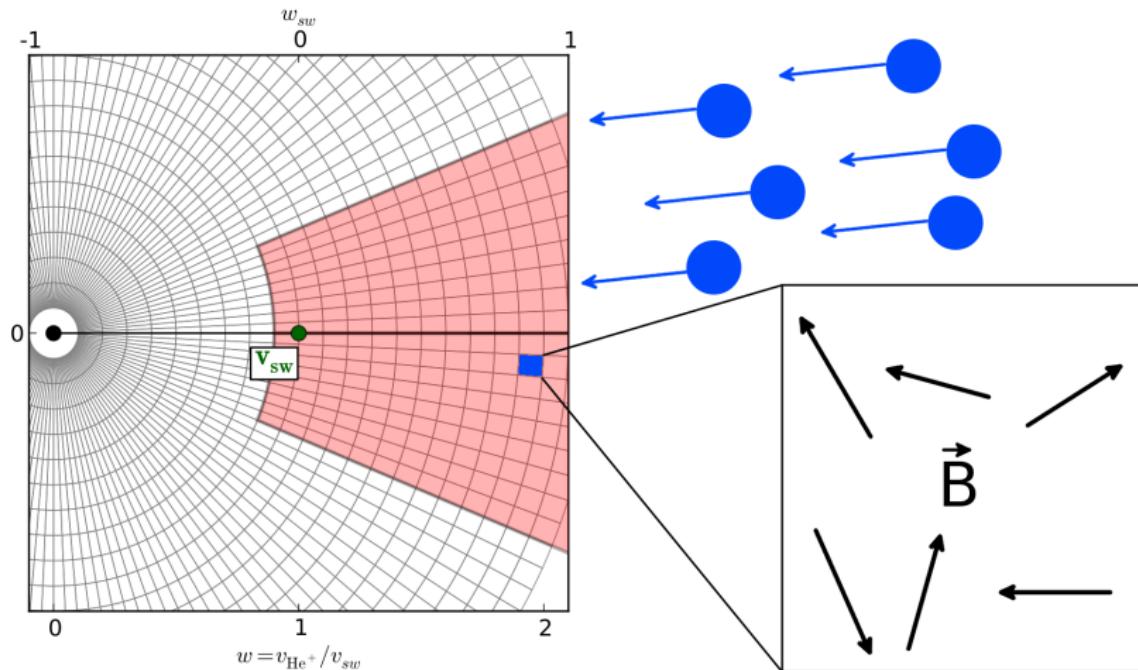
- ▶ Angular resolution → 2D VDF
- ▶ Transformation from spacecraft- to solar-wind frame

Analysis



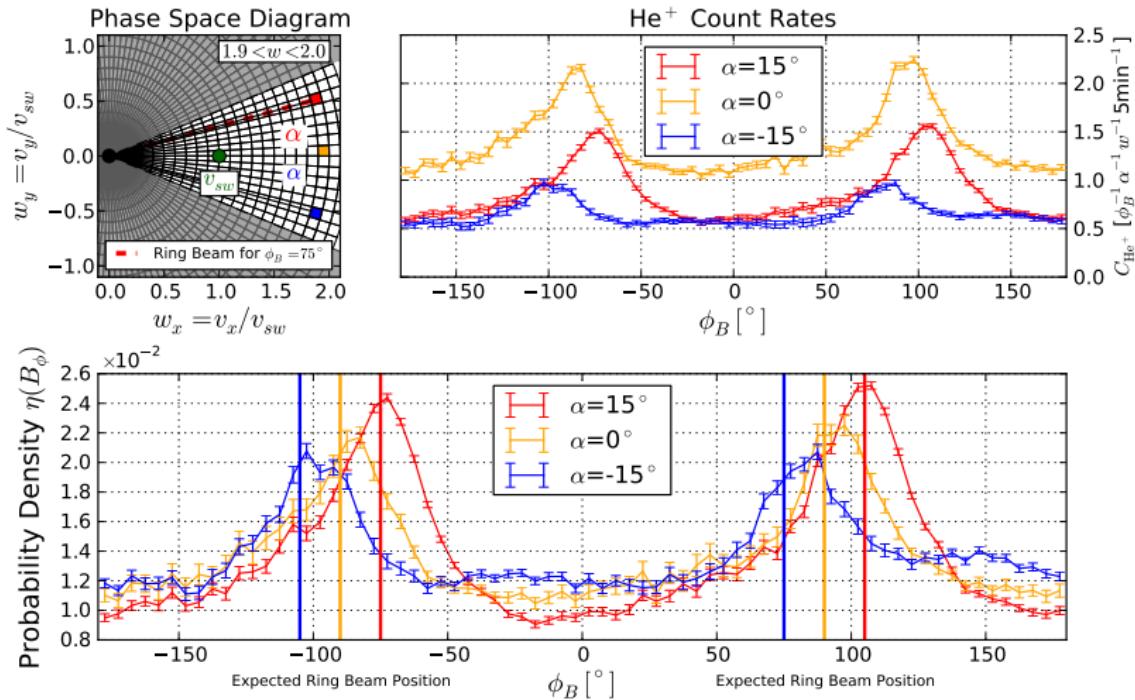
- ▶ requires efficiency correction
- ▶ efficiency of α bins poorly known

Analysis

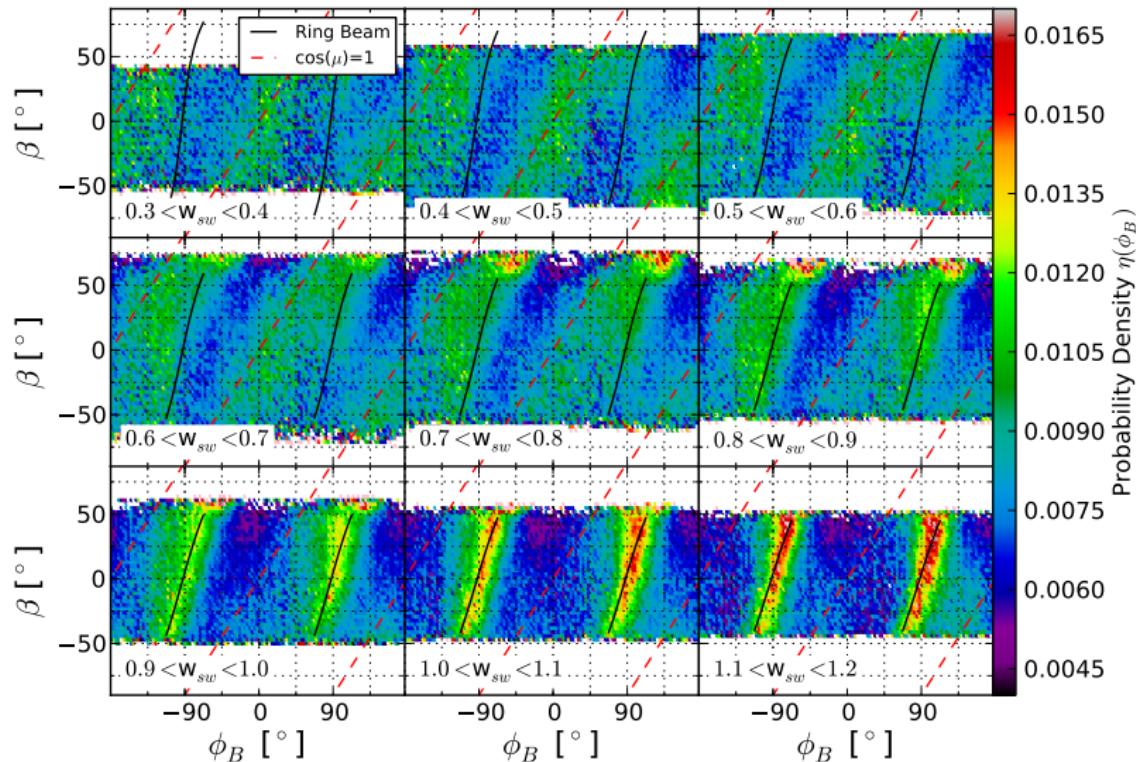


- ▶ circumvent unknown efficiency
- ▶ loss of absolute intensity information

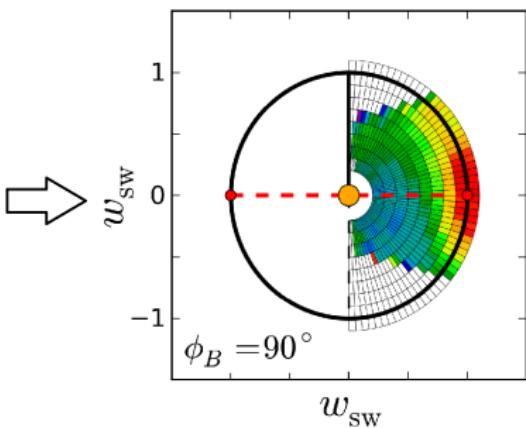
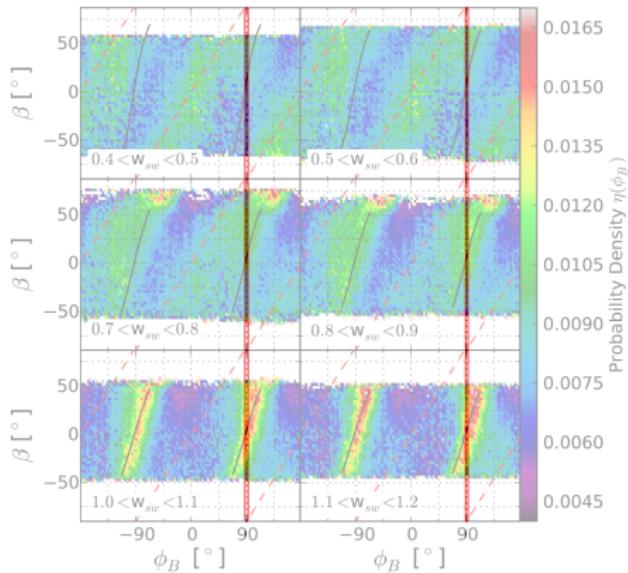
Analysis



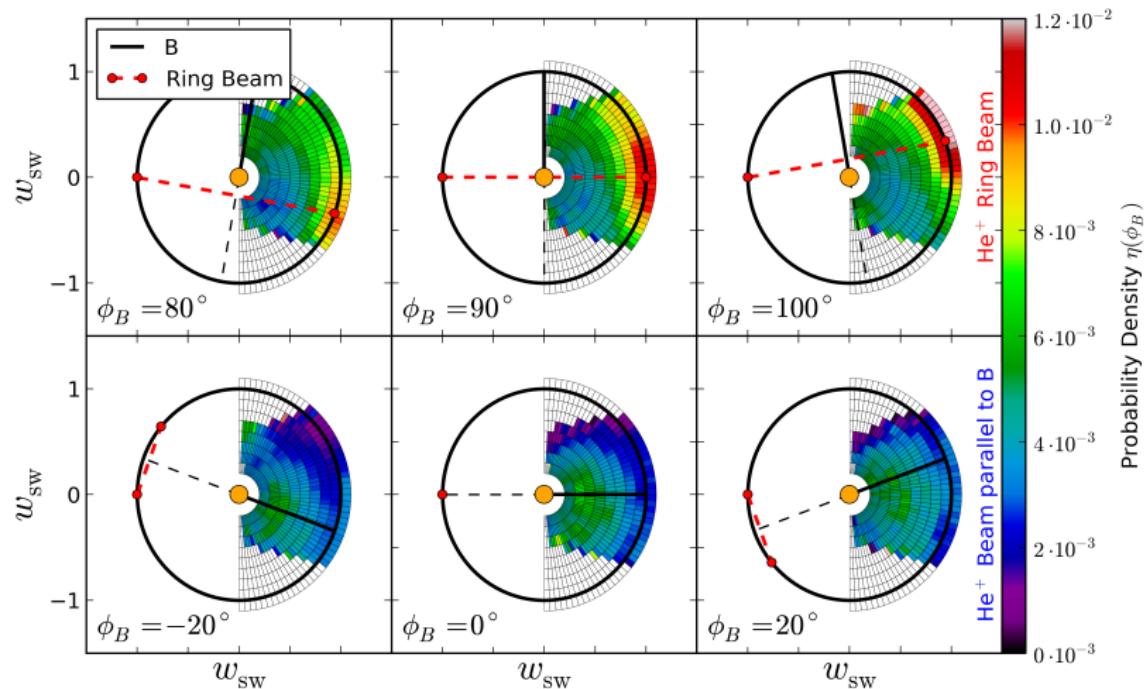
Results



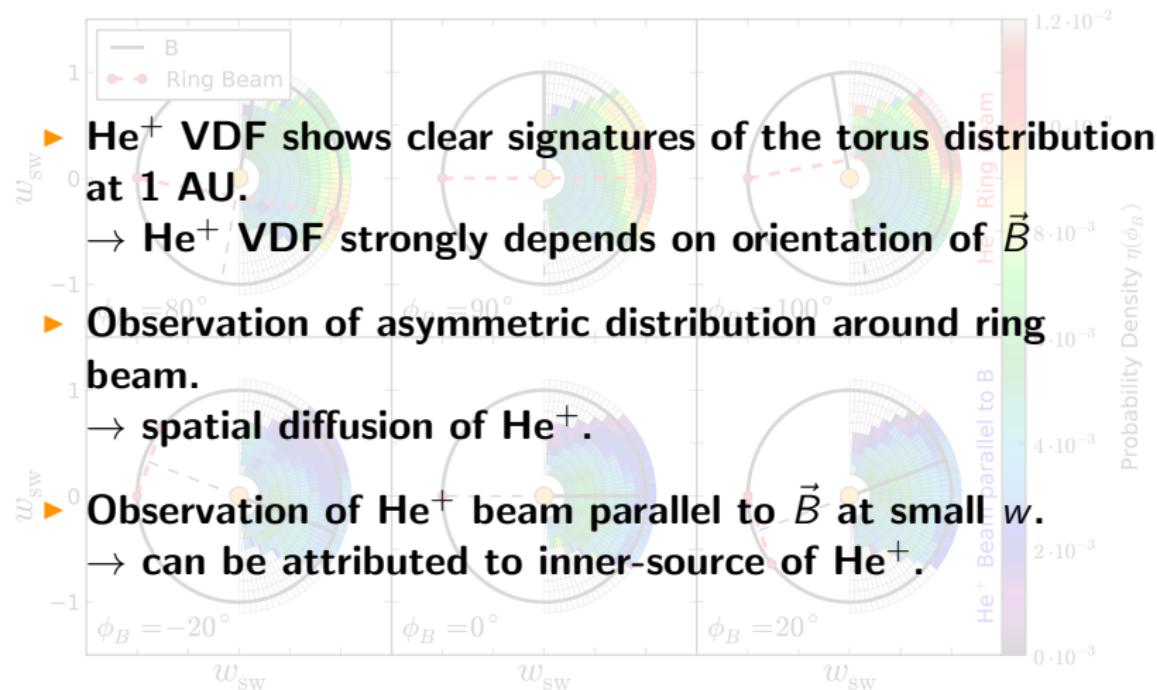
Transformation to reduced VDF



Features of the reduced VDF

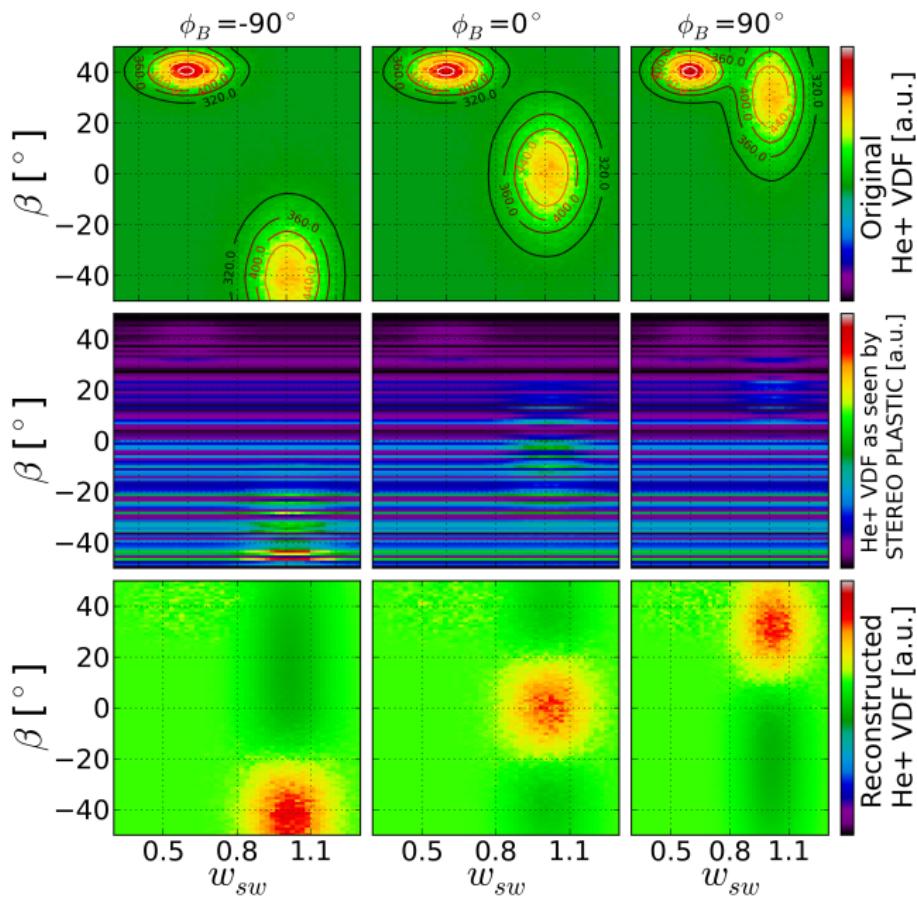


Conclusion

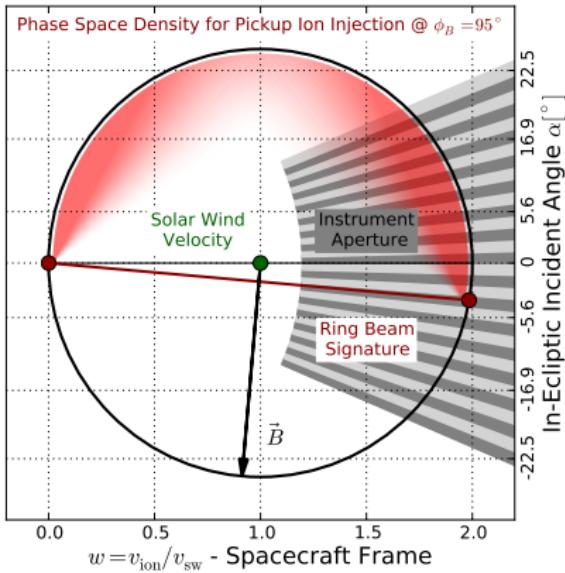
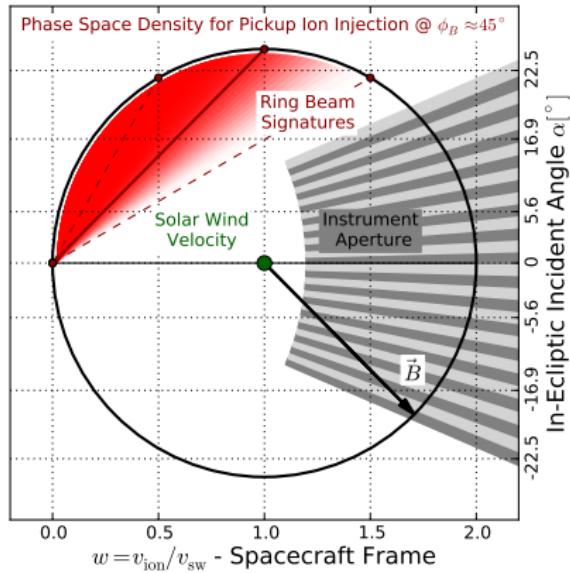


Backup

Proof of Concept



PUI Diffusion



Difference of frames

