Splash dynamics of aeolian sediment transport

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UC SANTA BARBARA

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This presentation participates in OSPP

Outstanding Student & PhD candidate Presentation contest

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Motivation

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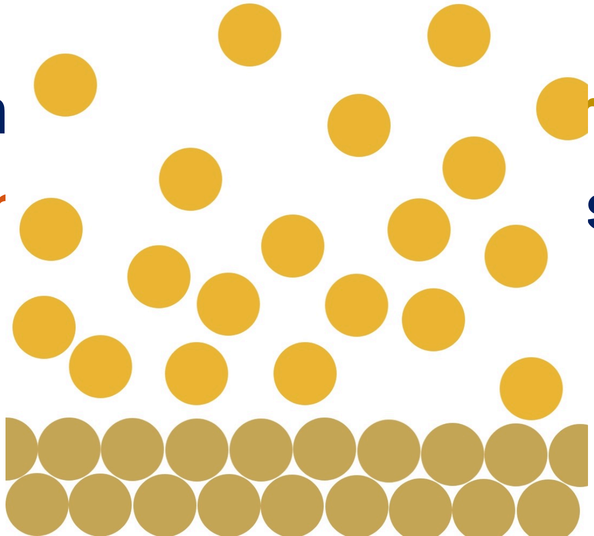
Wind Profile → Vertical Particle Concentration → Splash event

Objective 1

Objective 2

How does th

and splash dynar



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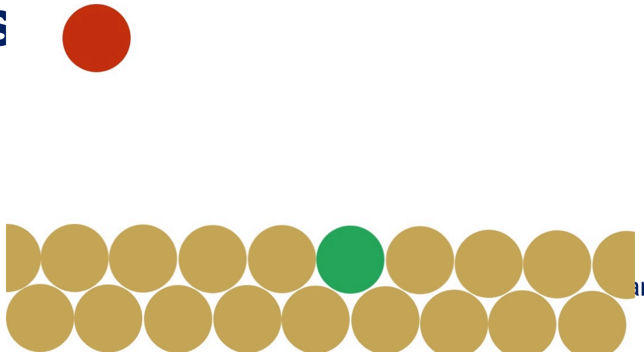
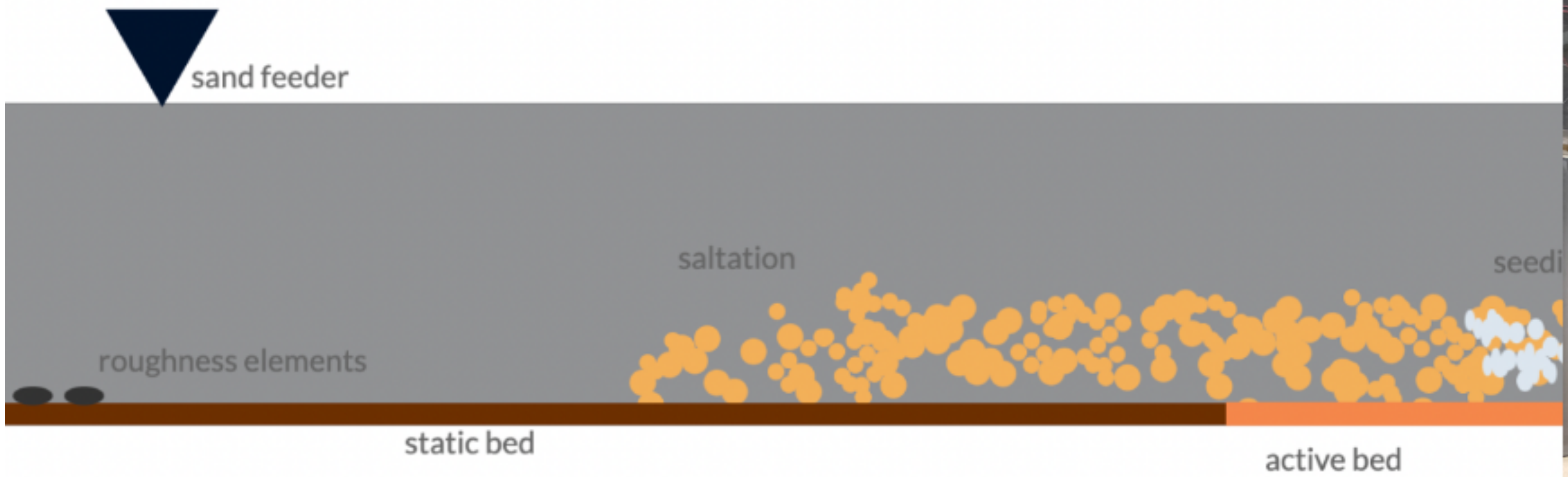
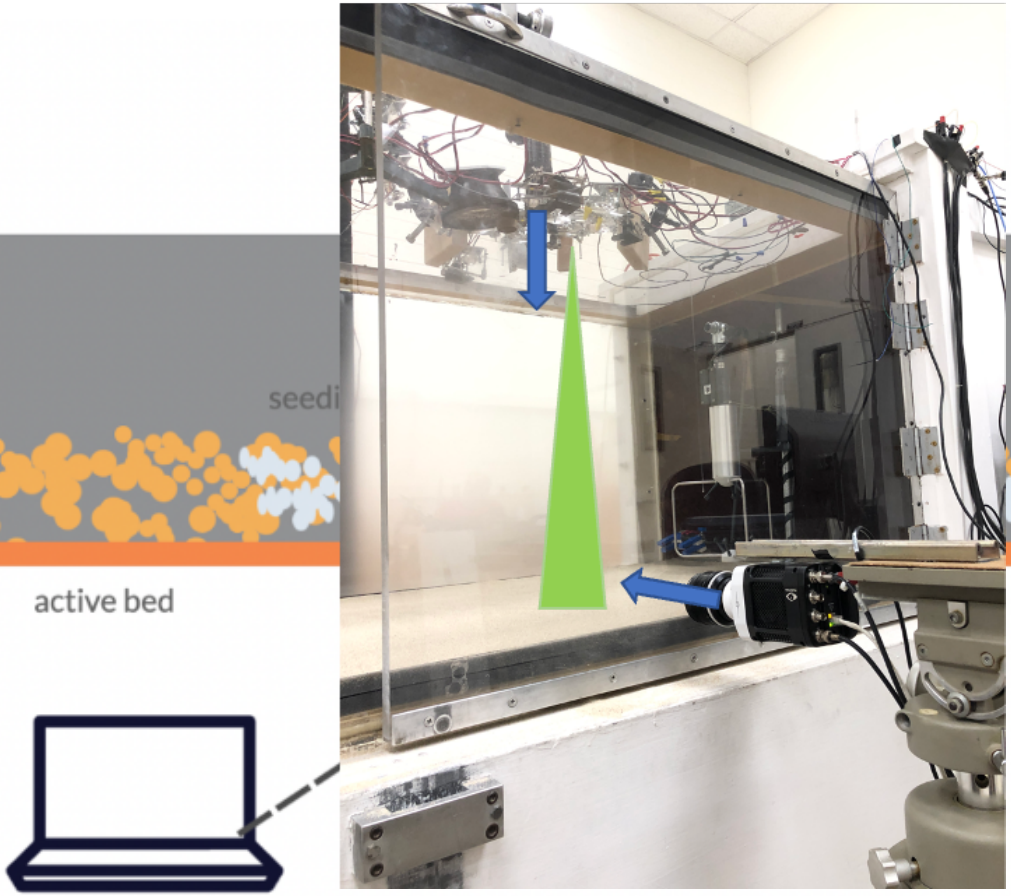


Wind tunnel PIV/PTV

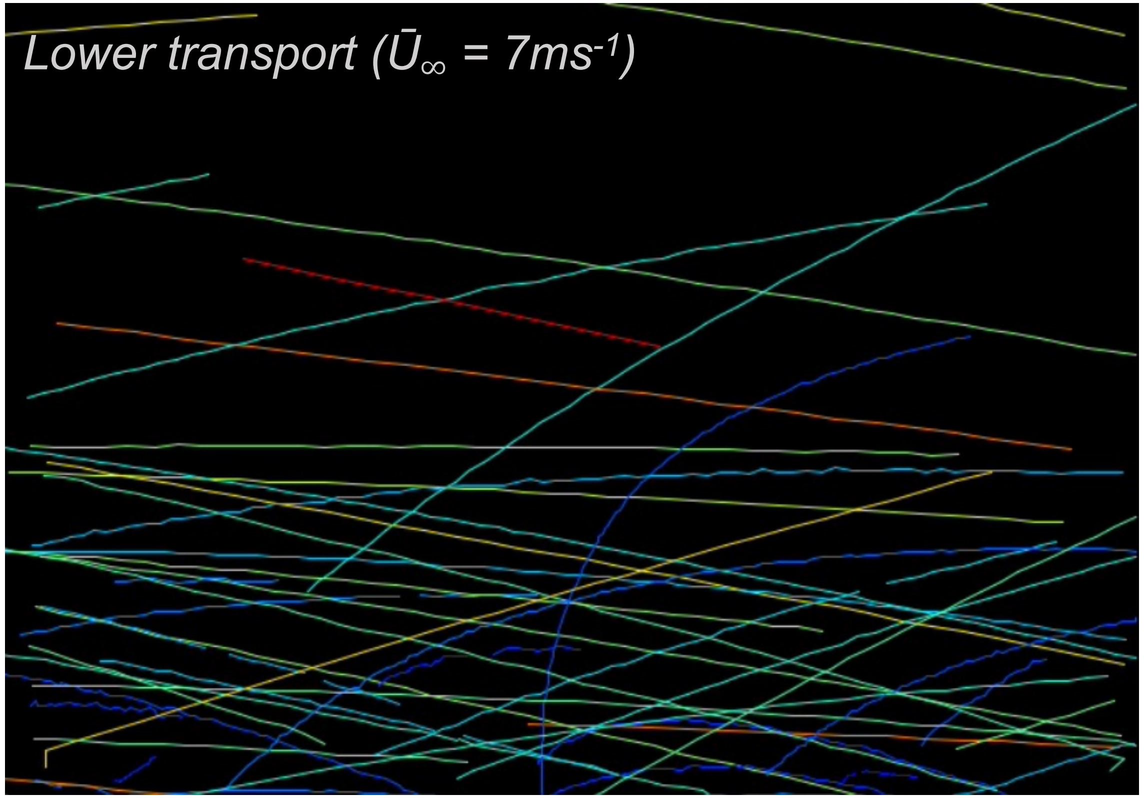


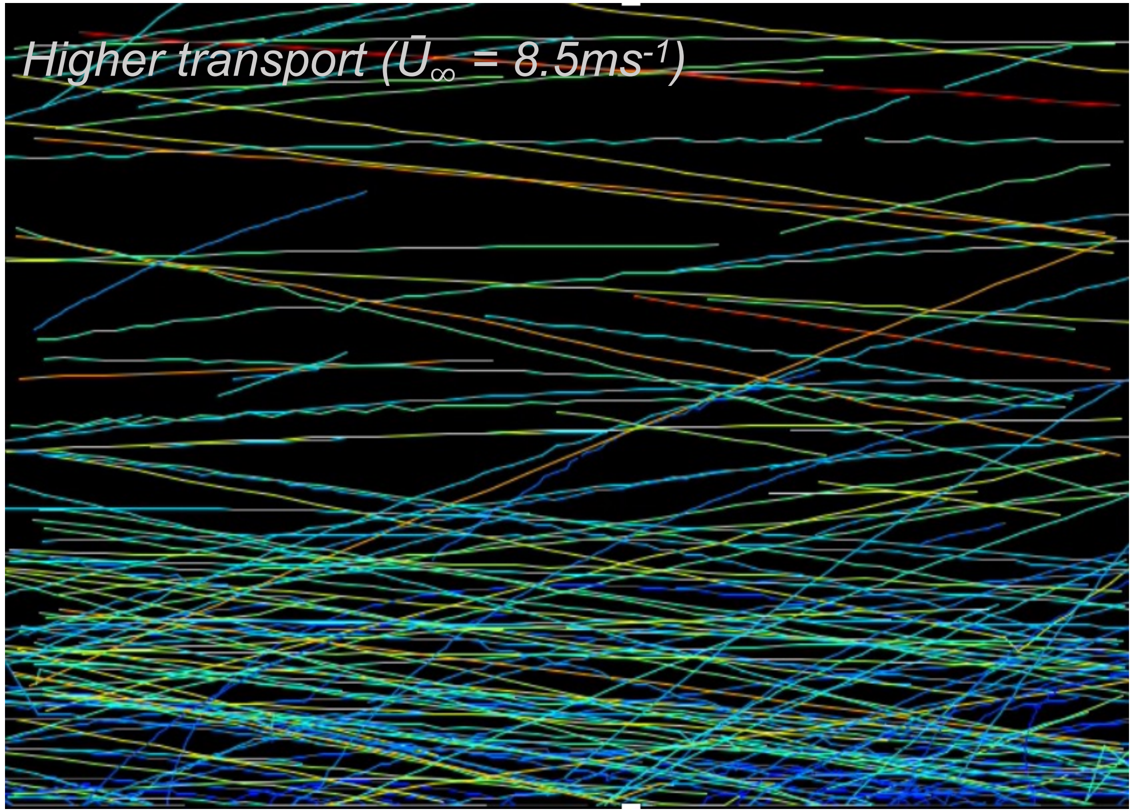


13.7 x 0.98 x 1.2m
Open-circuit
Ambient temperature and pressure conditions

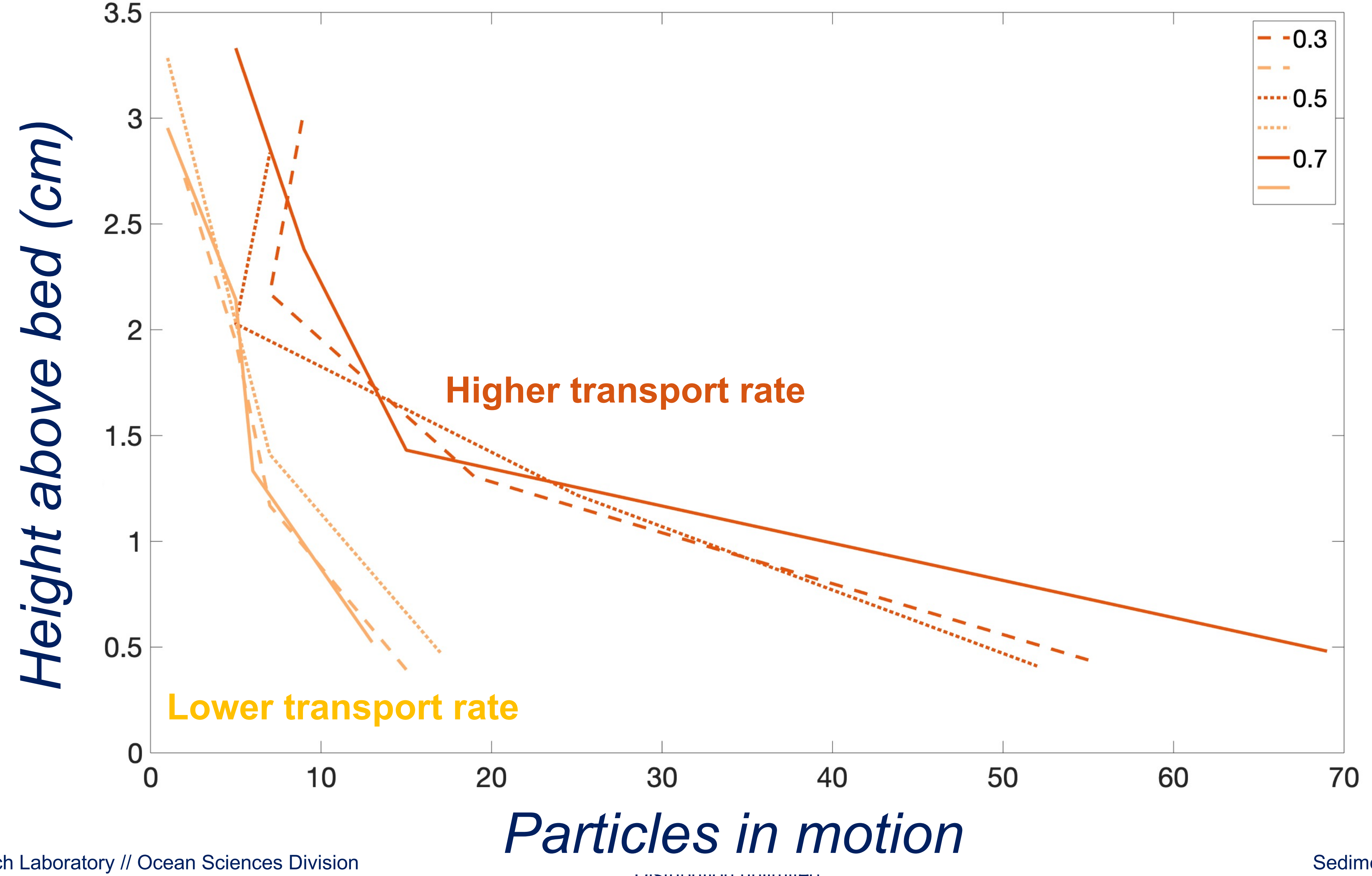
Particle Tracking Velocimetry: *vectors from tracking a single particle between sequential images*

Highspeed Imagery



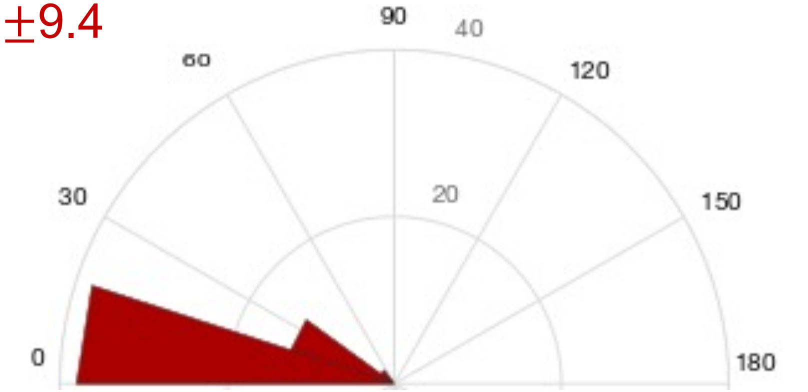


Objective 1: Vertical Profiles

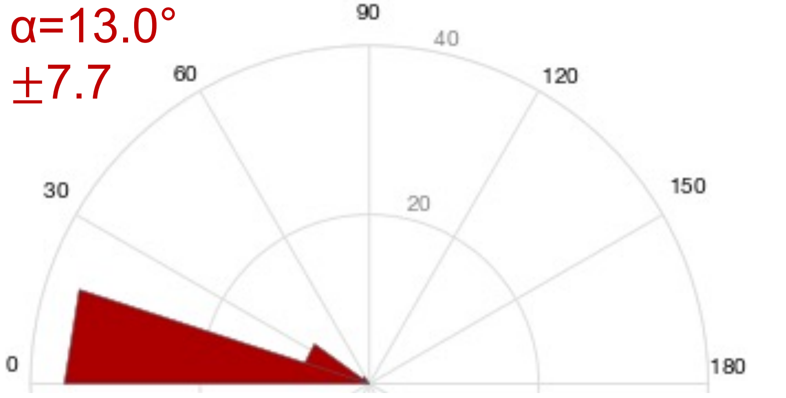


Objective 2: Splash Characteristics

α=14.7°
±9.4

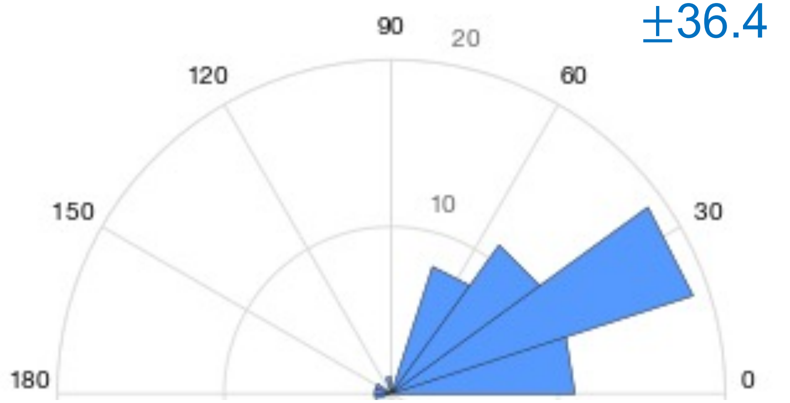


α=13.0°
±7.7



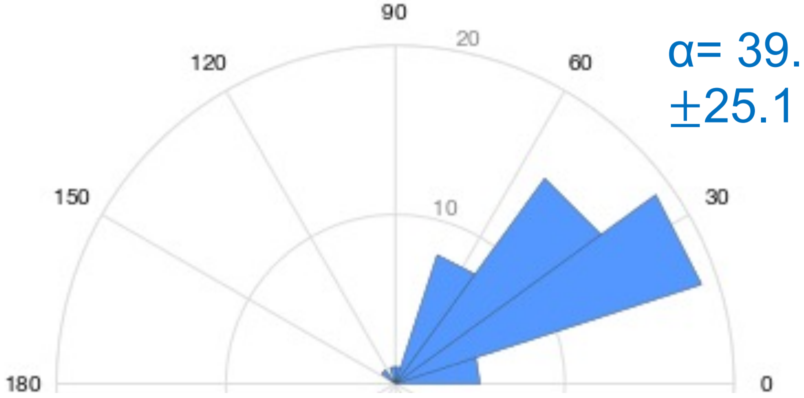
Lower transport

α= 41.6 °
±36.4

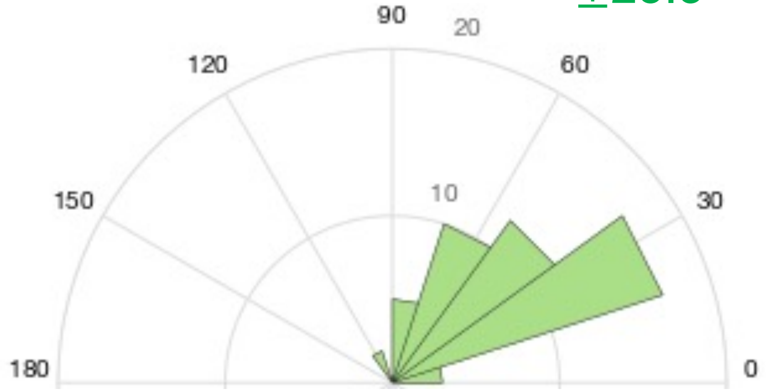


Higher transport

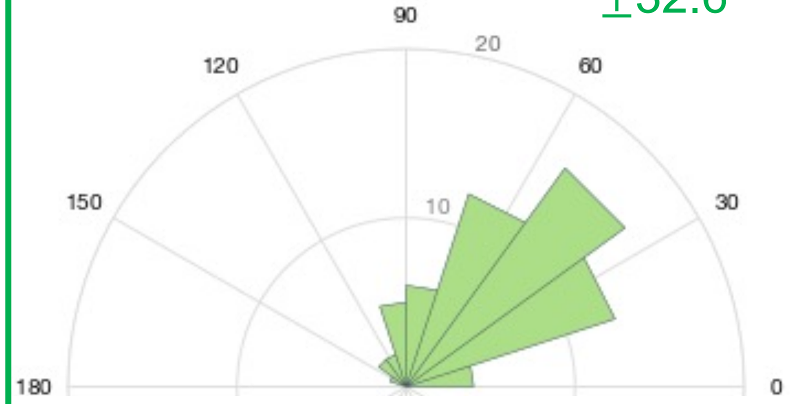
α= 39.6 °
±25.1



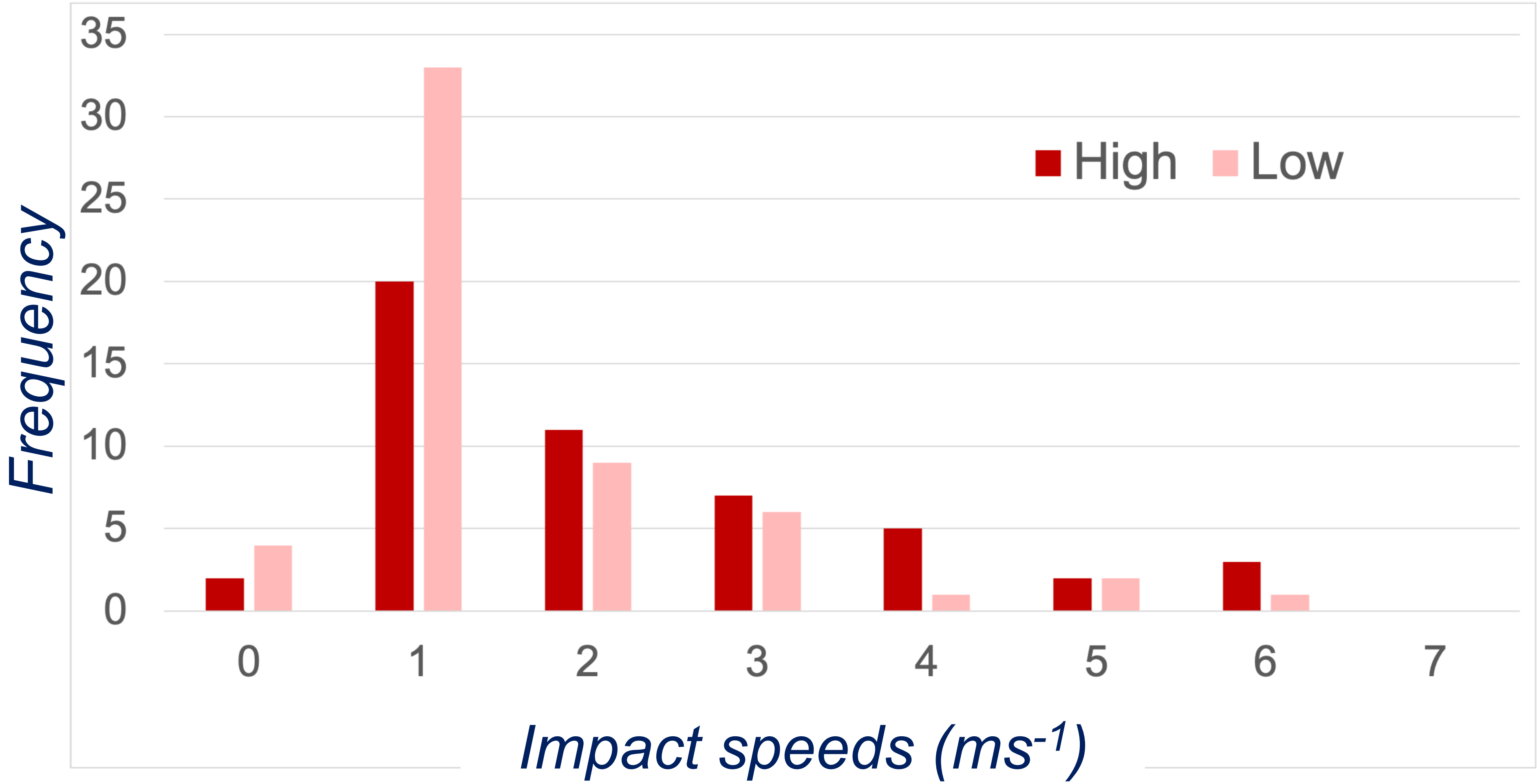
α= 47.7°
±25.3



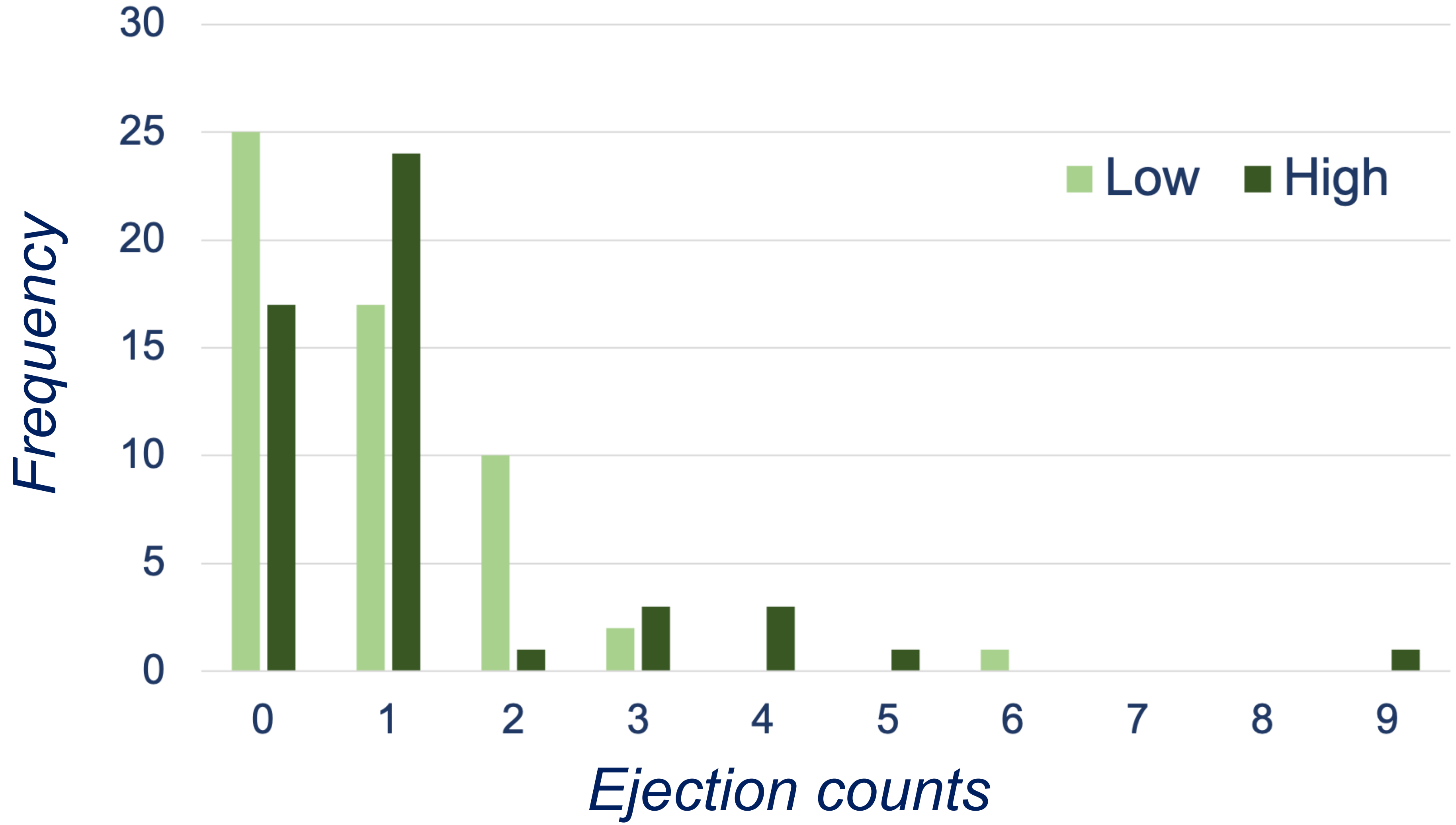
α= 57.8°
±32.6



Objective 2: Splash Characteristics



Objective 2: Splash Characteristics



Conclusions

Wind Profile

Vertical Particle Concentration

Splash event

How does the vertical concentration profile and splash dynamics change across a range of wind speeds?

Check out awesome research by my colleagues in GM6.9:

@ 08:50 Dr. Christy Swann
Measuring turbulence in a natural boundary layer using a field-based particle tracking velocimetry system

@ 09:05 Dr. Sarah Trimble
Capturing volumetric ripple migration with a terrestrial laser scanner

Literature

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Software:

TrackMate (Tinevez et al., 2017)

Manual Tracking (Cordelires et al., 2005)