

Experimental Validation of a Spatial Anti-aliasing Plasma Wave Analysis Technique on a Hollow Cathode Plume

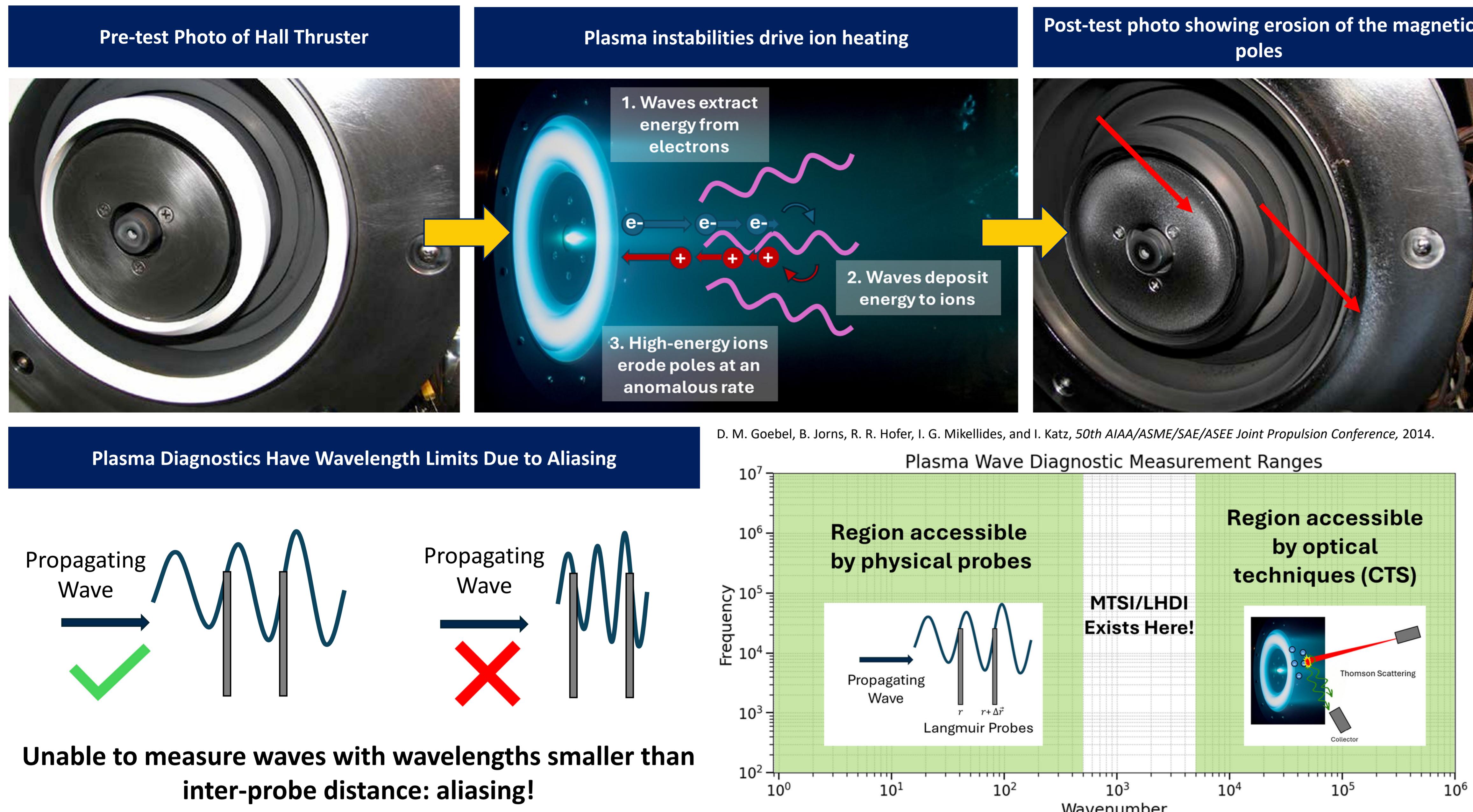


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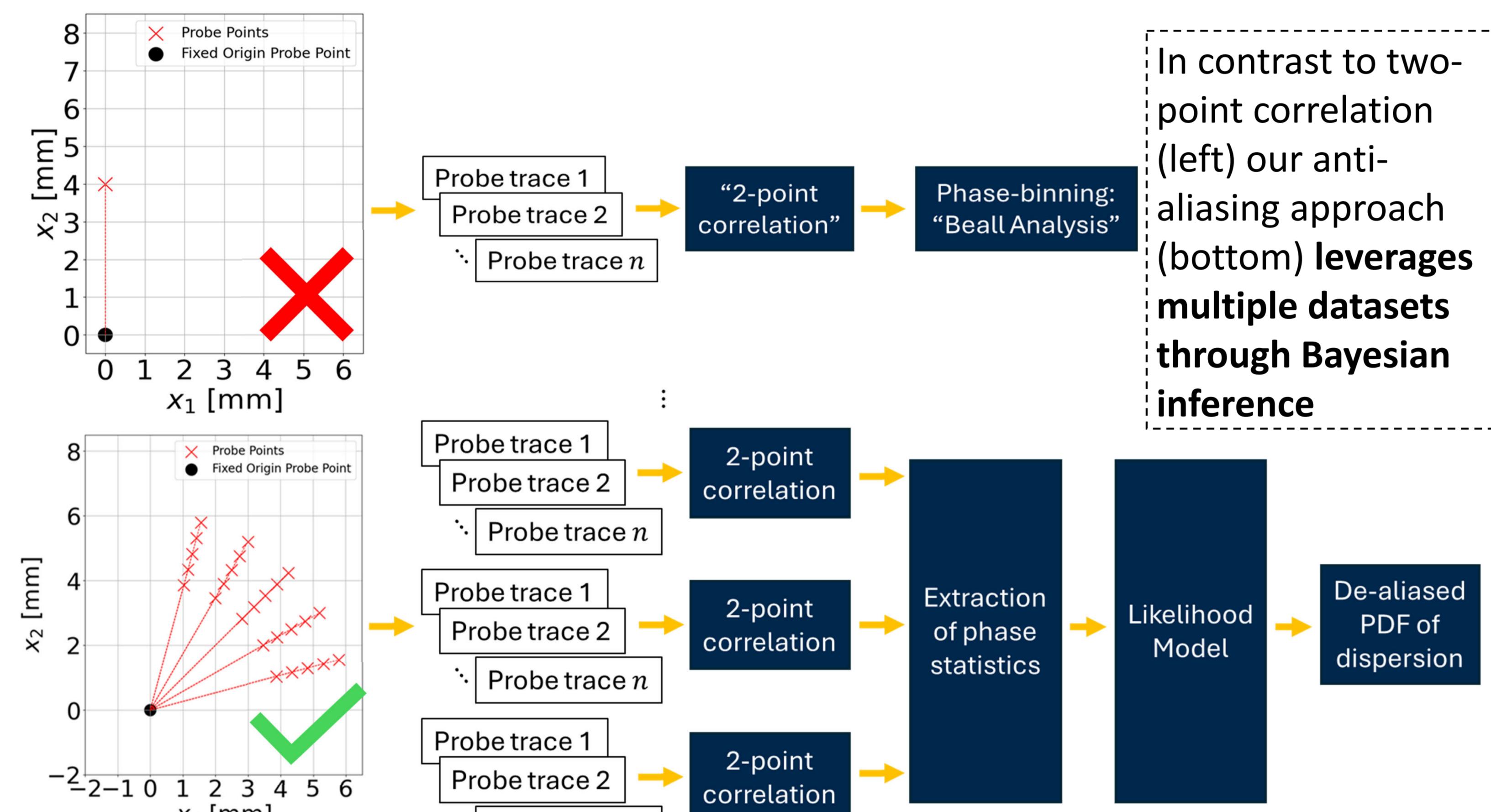
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Background

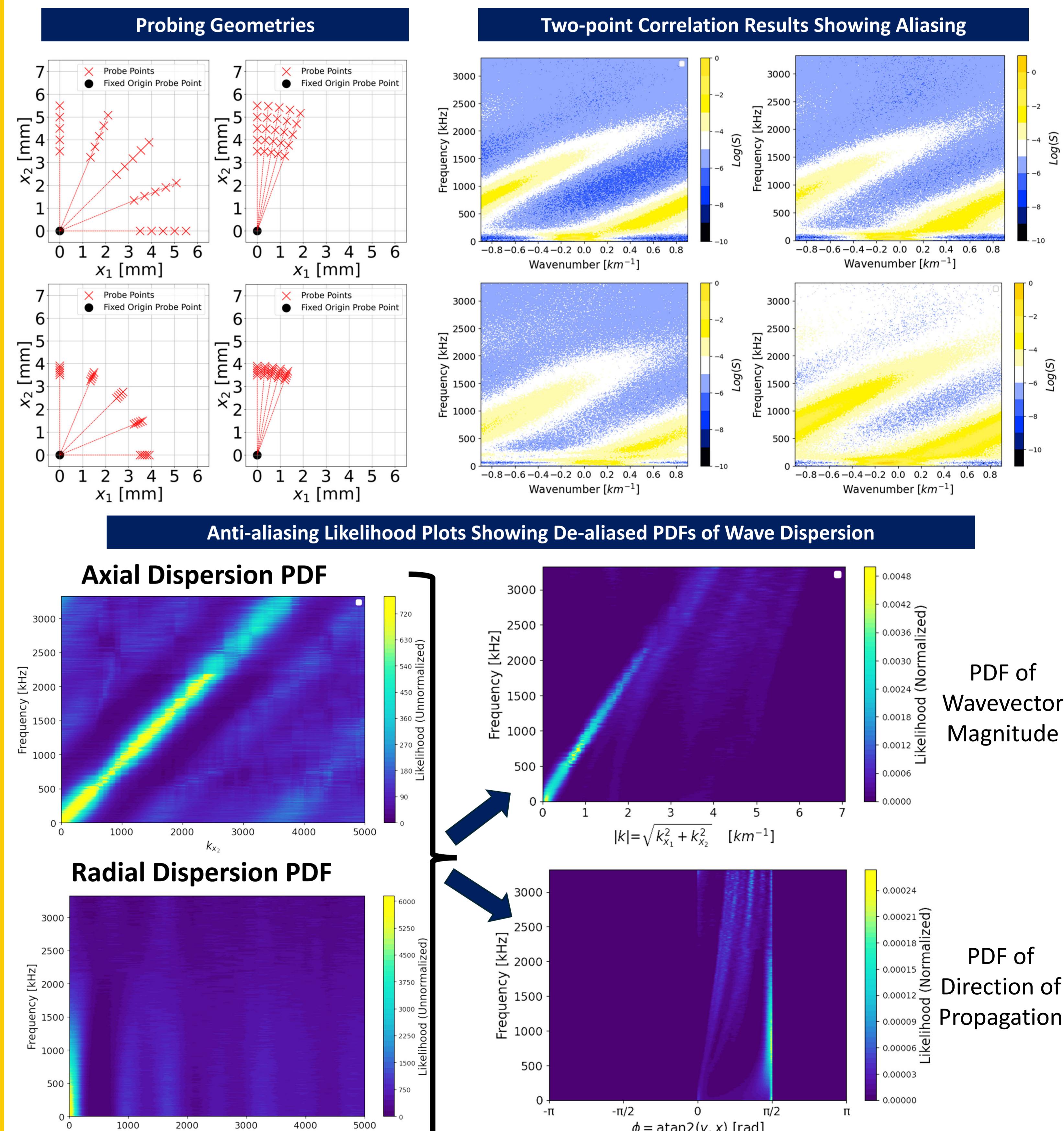


- Pole erosion** has superseded discharge channel erosion as the life-limiting mechanism of Hall thrusters
- Plasma waves** such as the modified two stream instability (MTSI) and lower hybrid drift instability (LHDI) are thought to dominantly contribute to pole erosion
- Measurements of these waves** are critical to understanding the exact processes causing life-limiting erosion
- Diagnostic limitations** have unfortunately precluded direct experimental measurement of these plasma waves
- Aliasing of wave measurements** has historically been the primary limitation of probe-based diagnostics, which we solve with our anti-aliasing approach

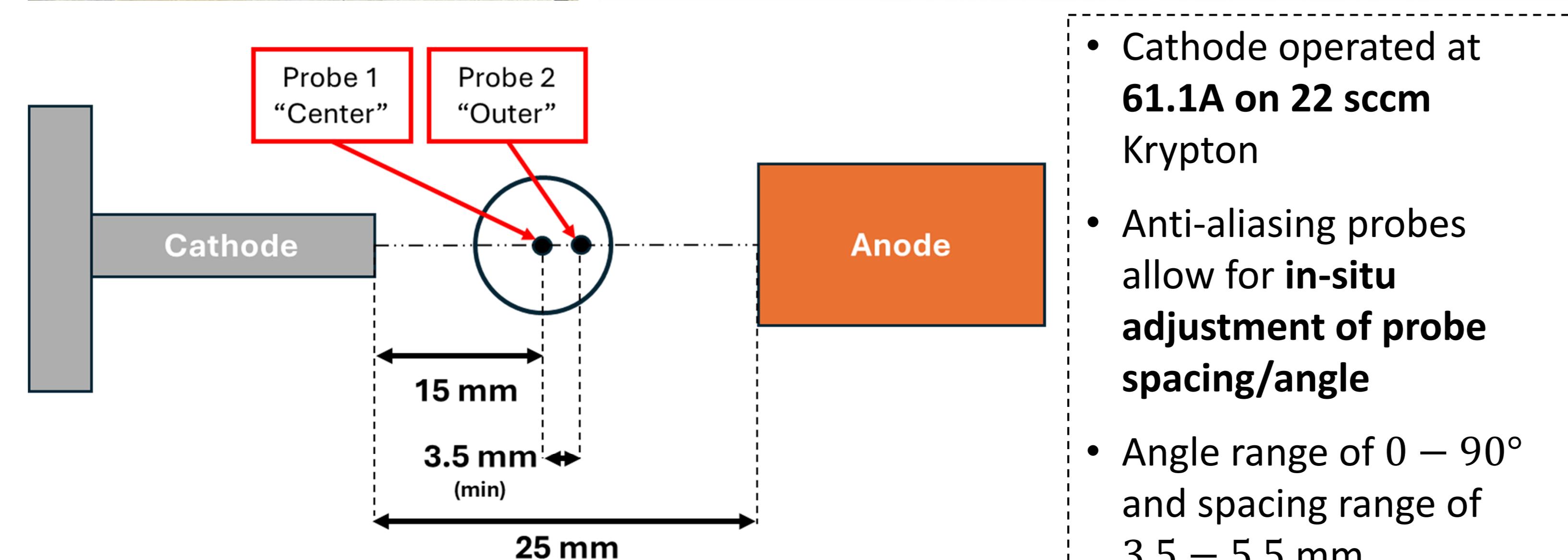
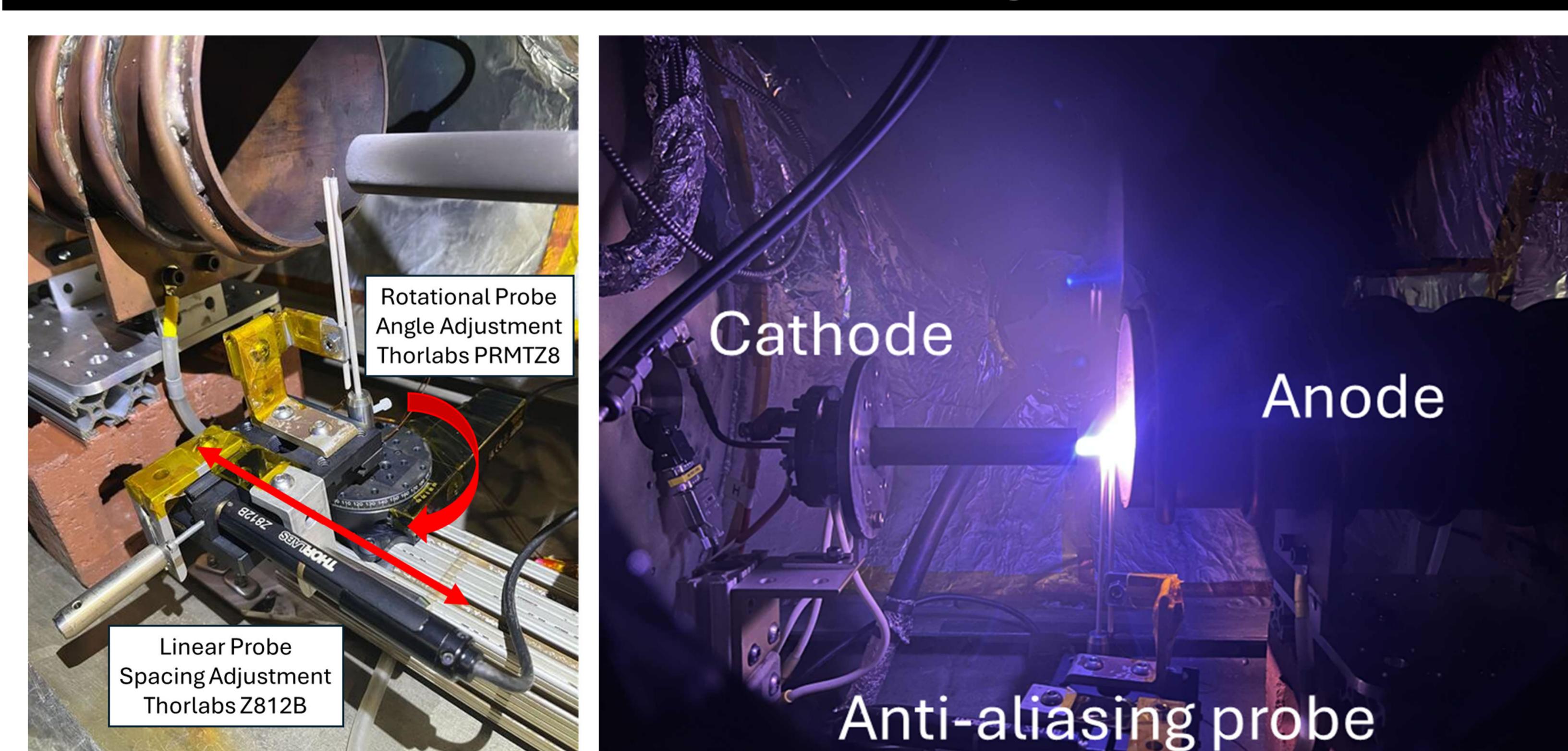
Anti-aliasing Analysis Technique



Results



Experimental Arrangement



Conclusion

- Anti-aliasing algorithm is able to reconstruct ion acoustic dispersion without aliasing
- We are able to infer magnitude and direction of wave propagation
- We have demonstrated this technique can be used to detect waves with wavelengths < 1 mm such as MTSI/LHDI

Acknowledgements

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