

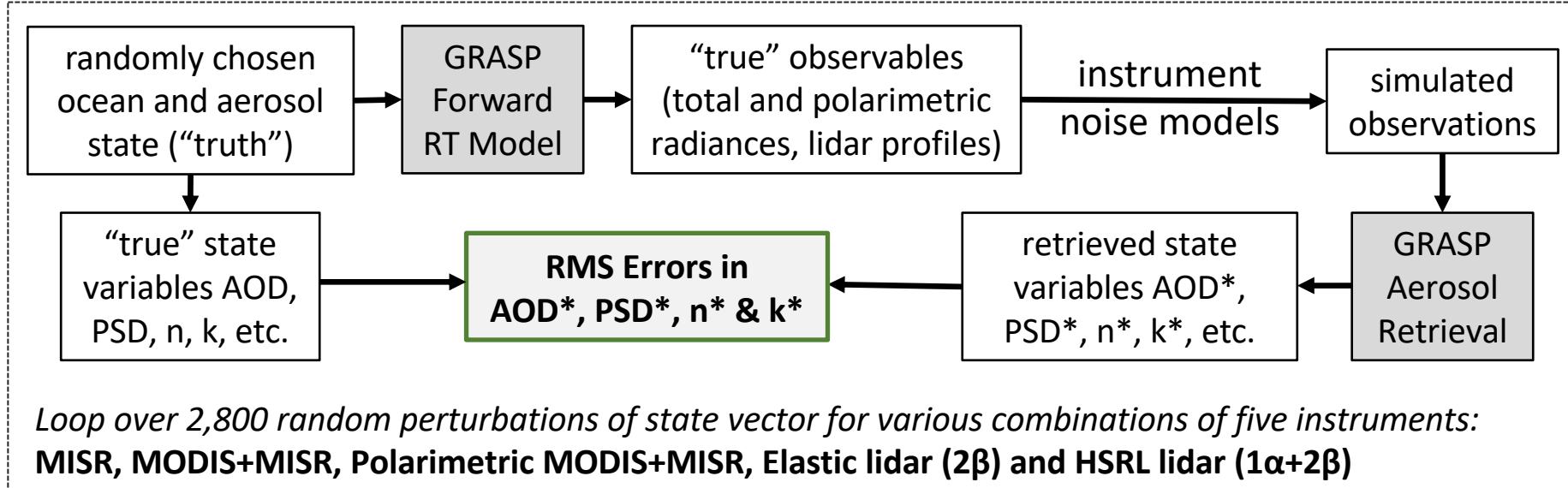
# Exploring the capabilities of synergistic passive and active remote sensing with a new aerosol retrieval testbed

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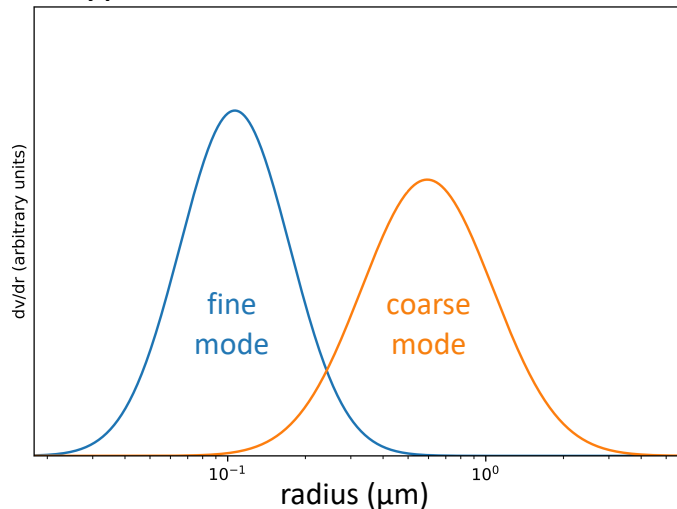
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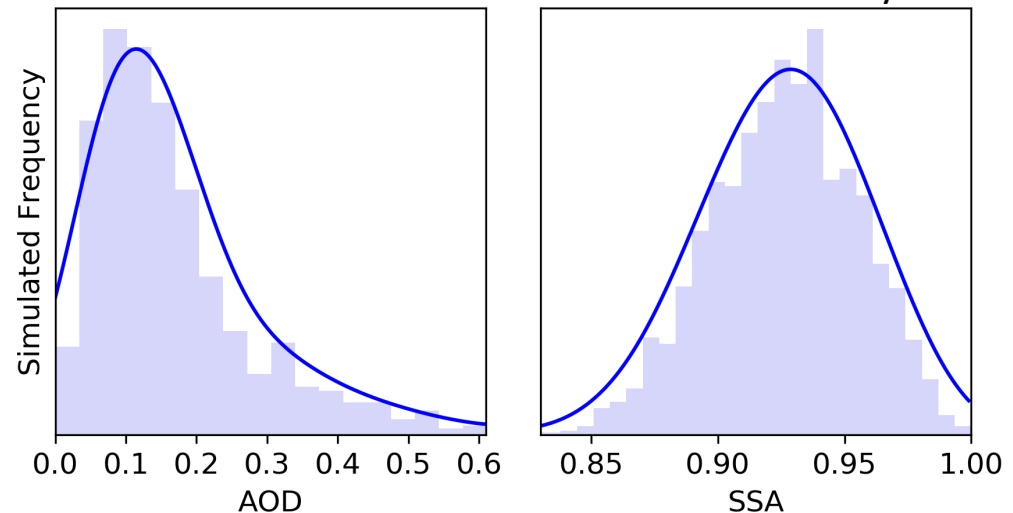
# Monte Carlo Testbed Retrieval Simulation Approach



Typical simulated size distribution

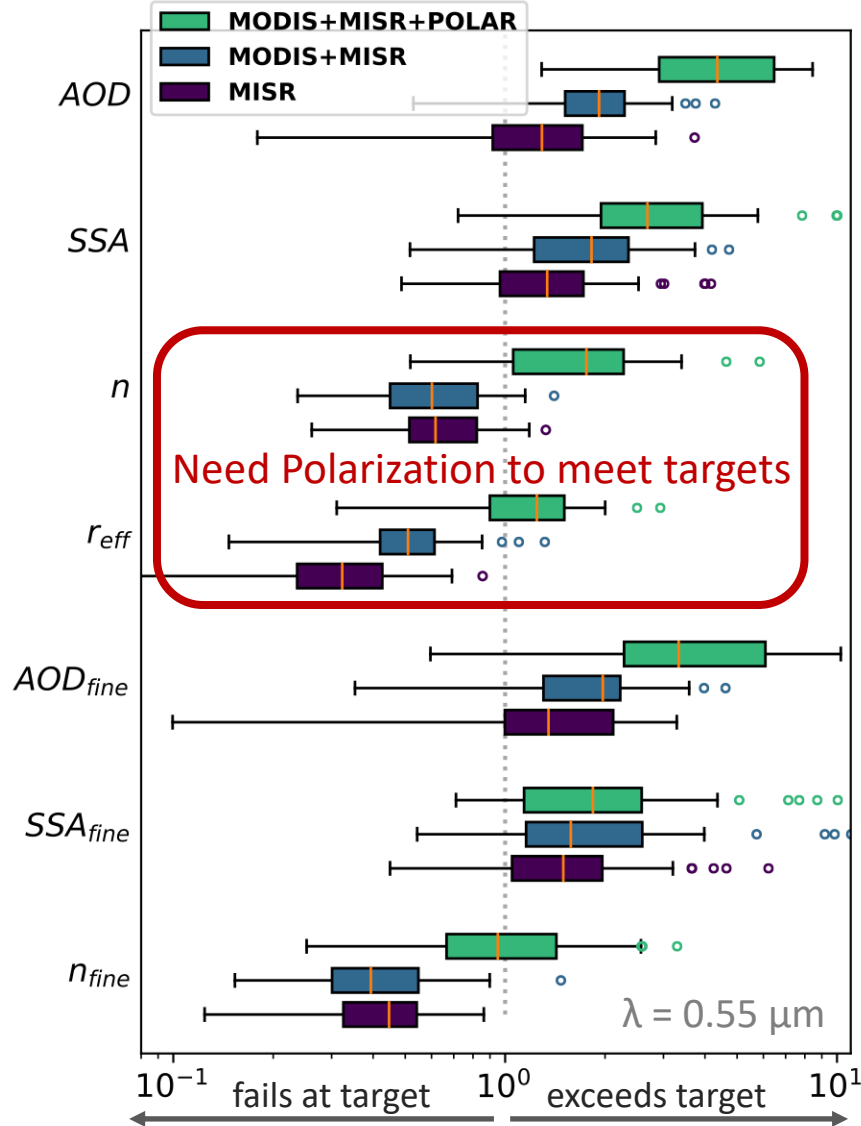


PDFs of AOD and SSA simulated in this study

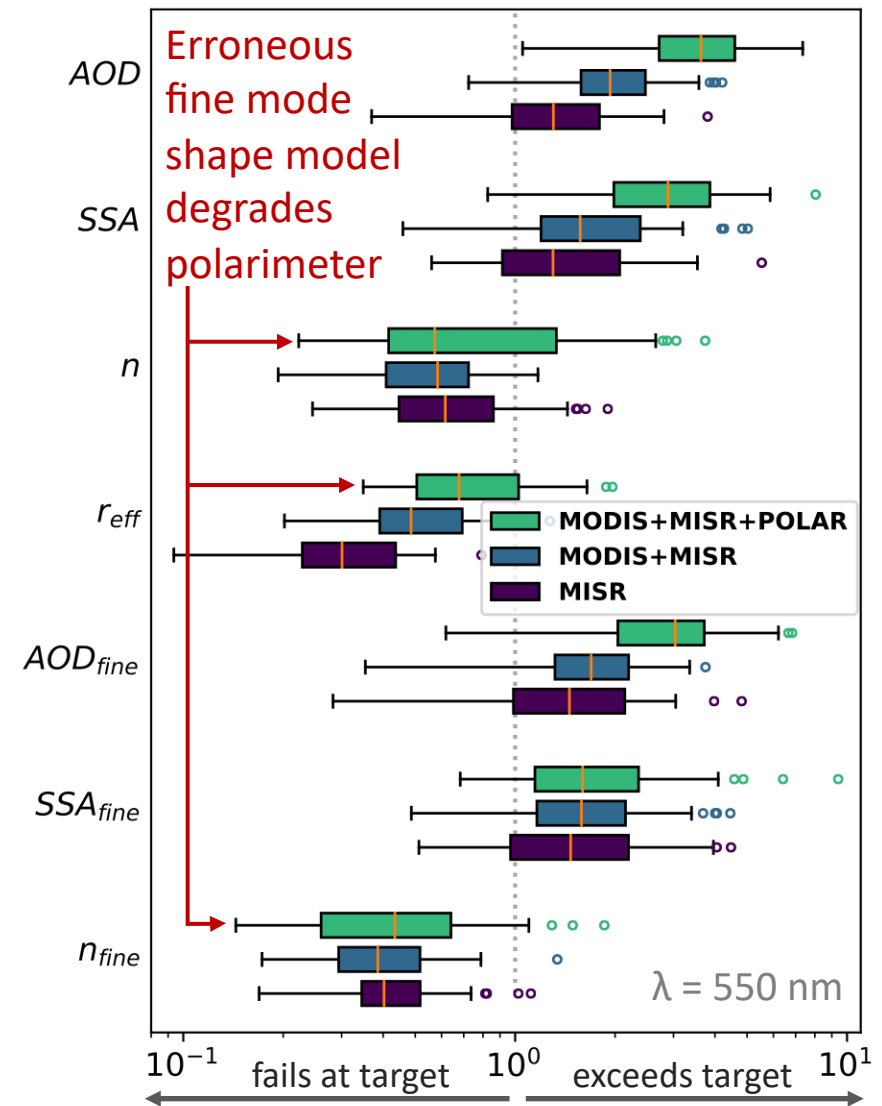


# Polarimetric retrievals are sensitive to assumptions of fine mode shape

## Correctly modeled particle shape

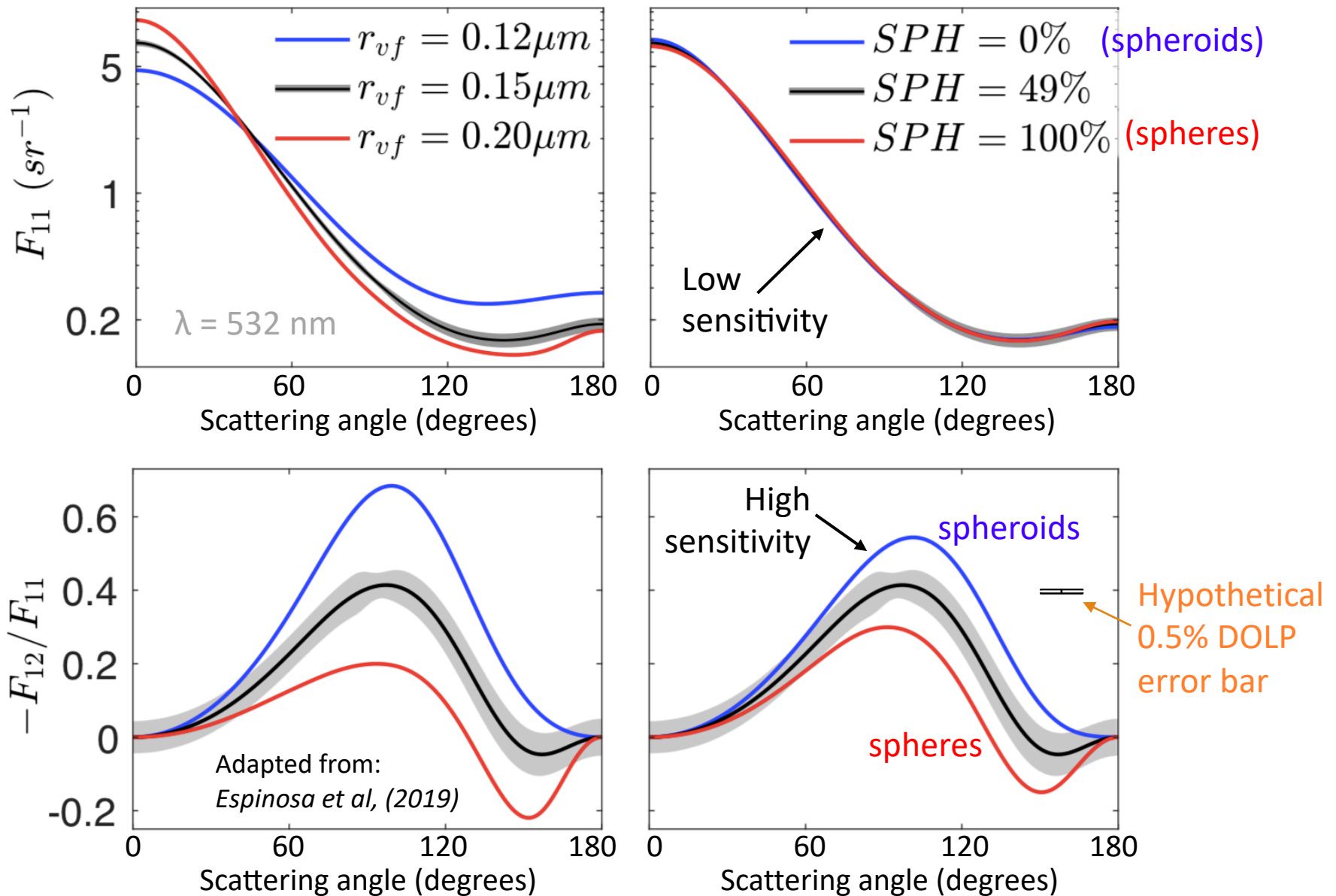


## Observing fine mode spheroids



\* Targets based on APS requirements proposed by Mischenko et al. (2004)

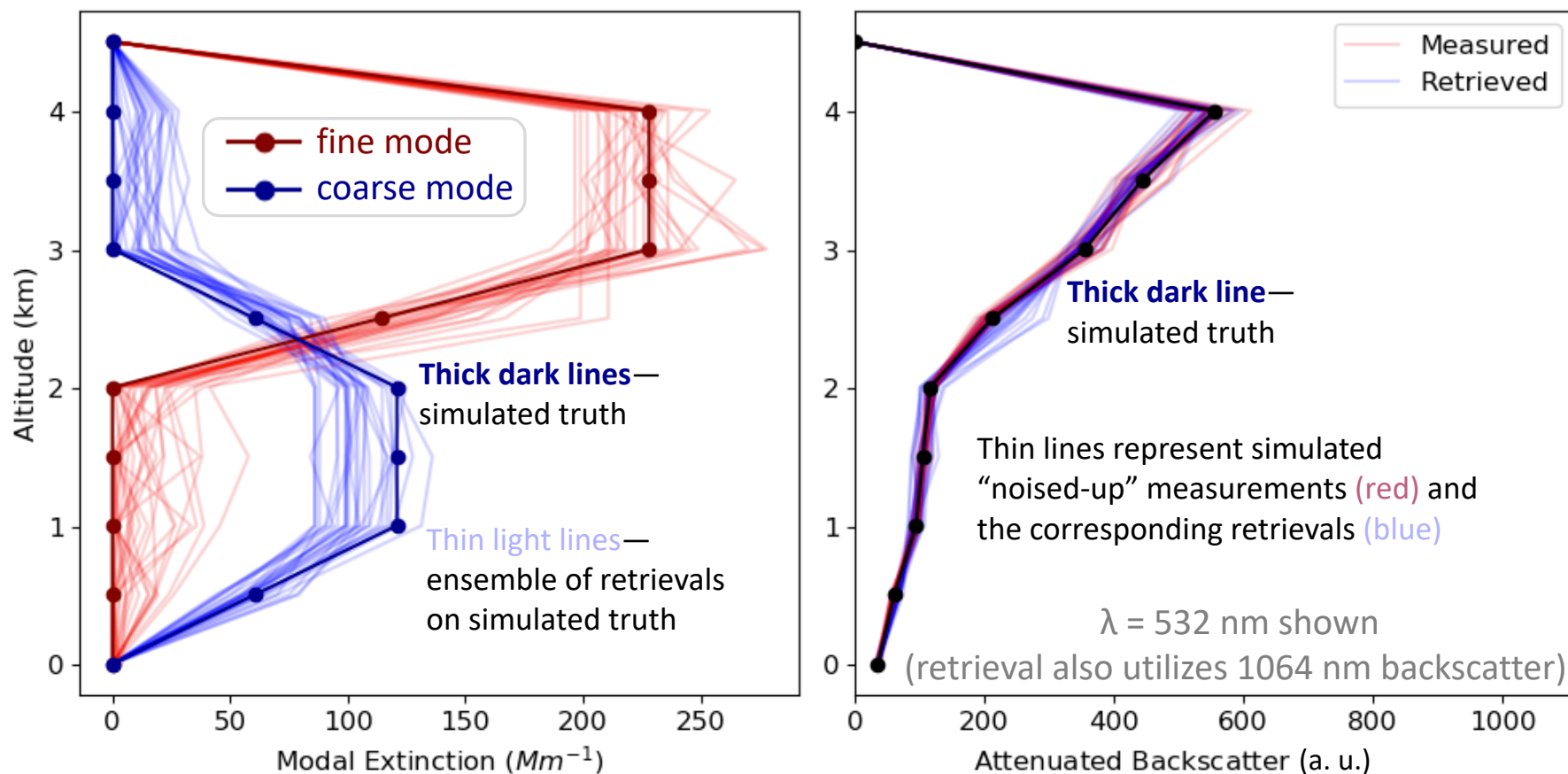
# Fine mode angular scattering: spheres vs spheroids



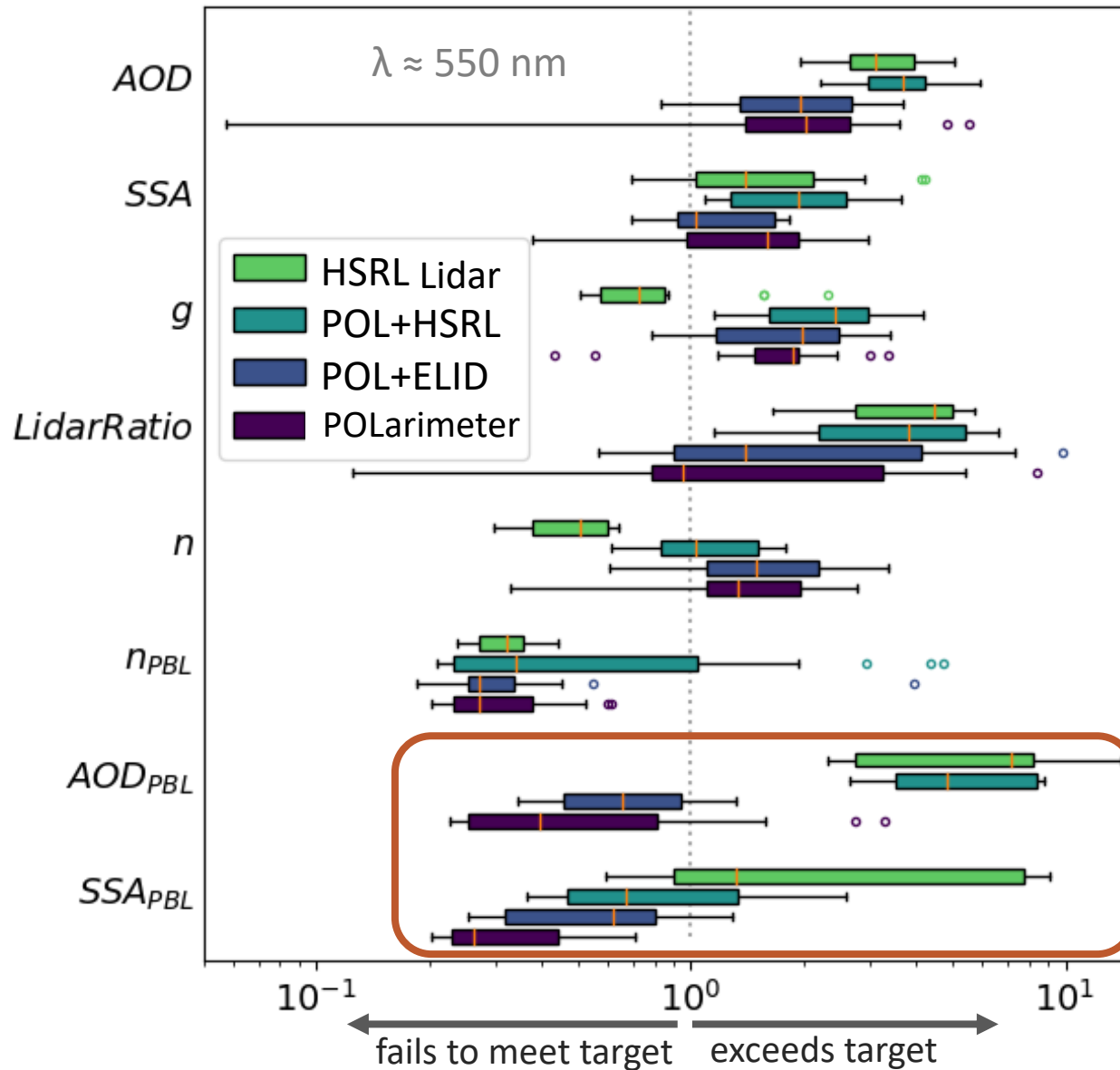
# Joint retrieval example: elastic lidar + polarimeter

A synergistic retrieval of total and polarimetric radiances paired with elastic backscatter lidar profiles can yield accurate, mode-resolved extinction profiles (at least in relatively simple scenes)

This is unachievable with elastic lidar or polarimeter data alone



# Uncertainty estimates of vertically integrated variables



Ingestion of lidar data into polarimeter slightly enhances the retrieval accuracy of some column integrated properties

AOD & SSA integrated over the PBL show the most benefit from joint lidar+polarimeter retrieval compared to polarimeter alone