



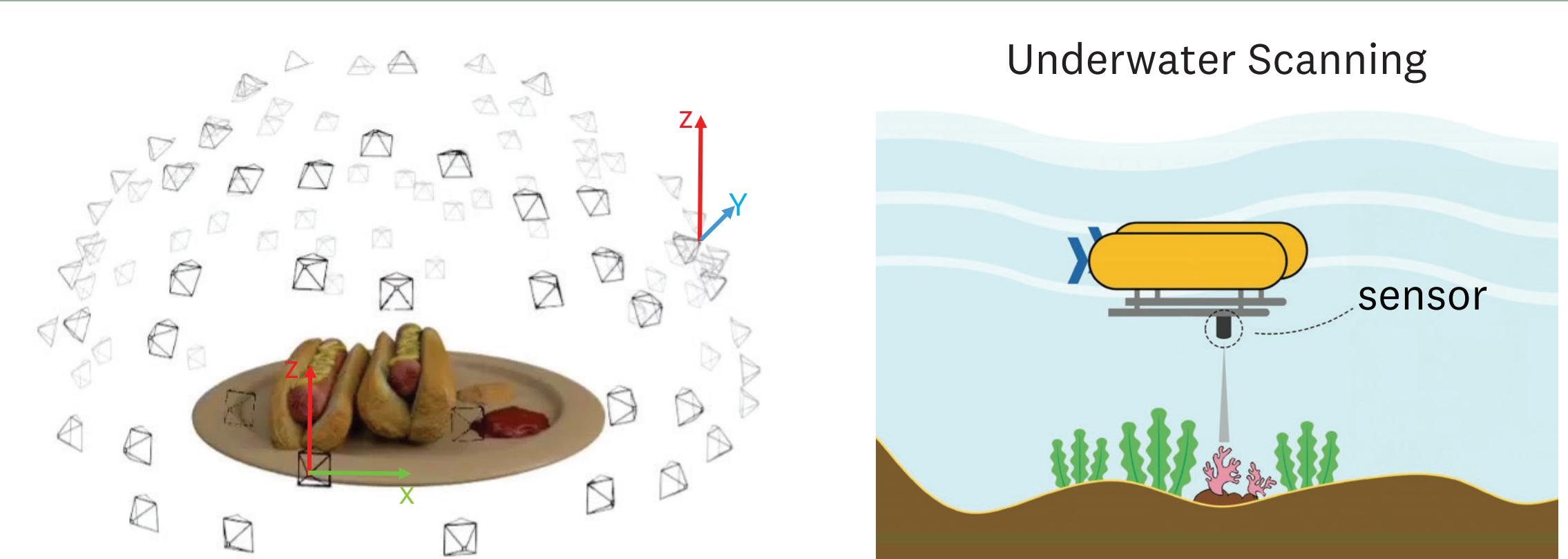
RIS

Z-Splat: Z-Axis Gaussian Splatting for Camera-Sonar Fusion

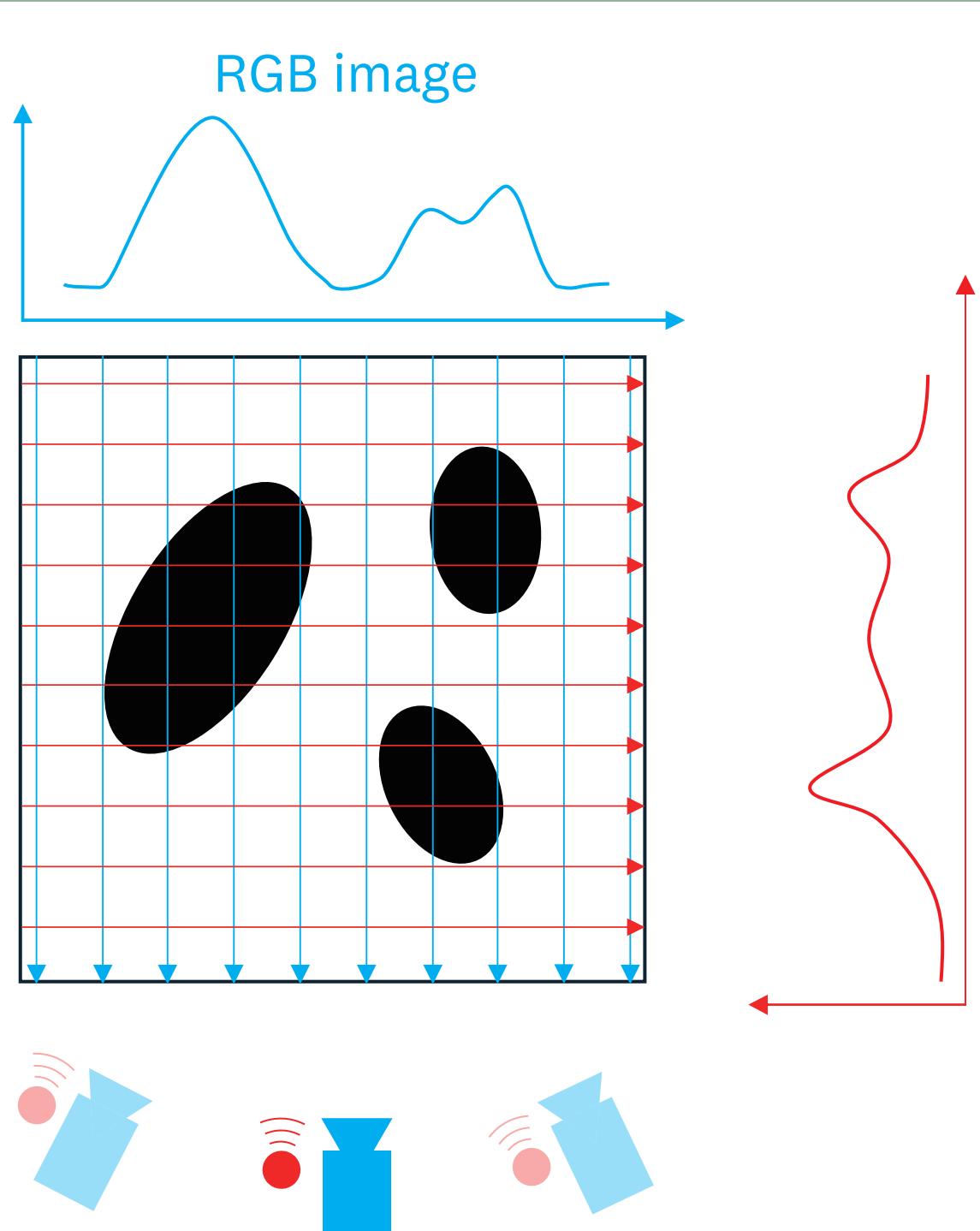
Ziyuan Qu¹, Omkar Vengurlekar², Mohamad Qadri³, Kevin Zhang⁴, Michael Kaess³, Christopher Metzler⁴, Suren Jayasuriya², Adithya Pediredla¹
 Dartmouth College¹, Arizona State University², Carnegie Mellon University³, University of Maryland⁴

Purpose

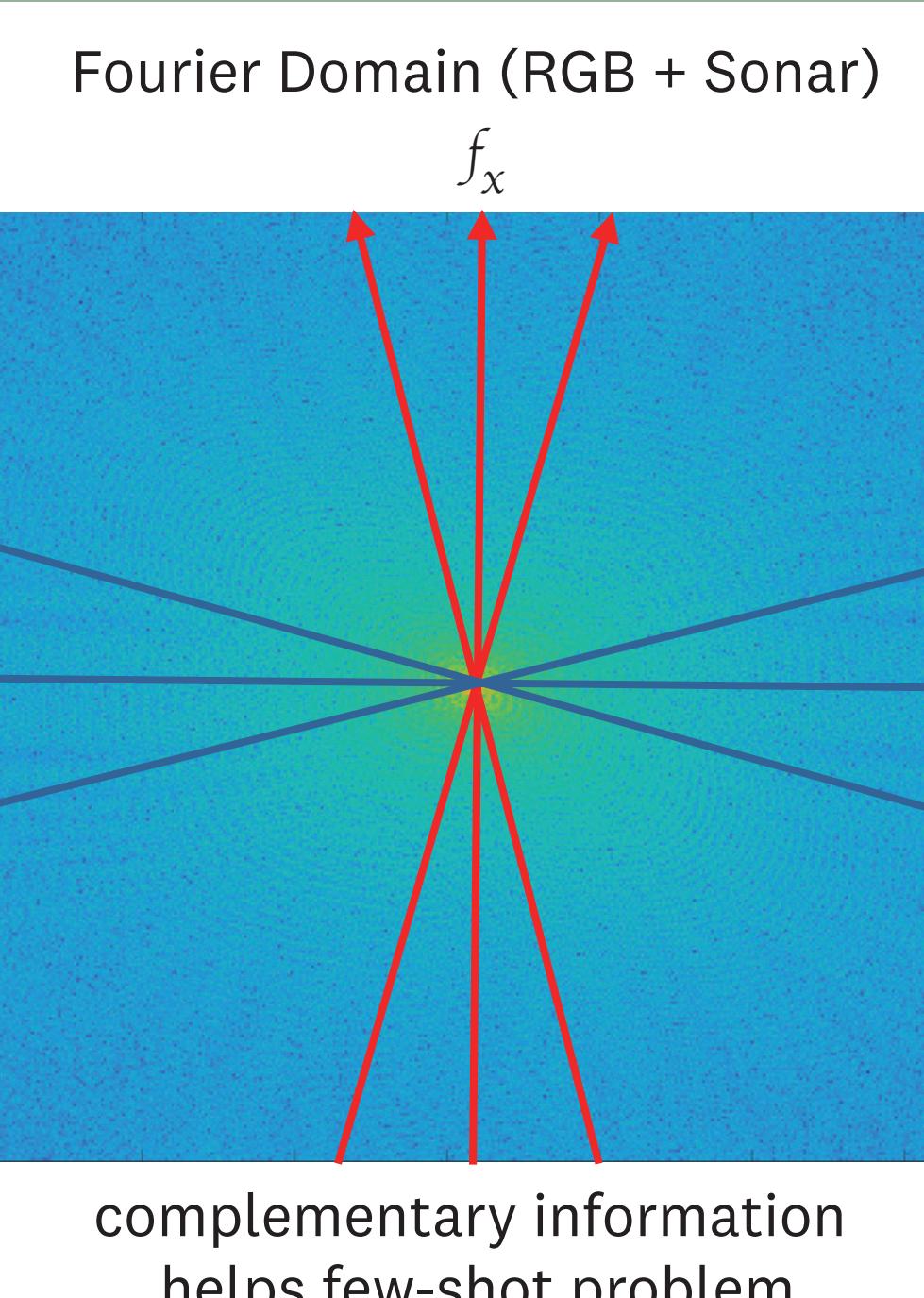
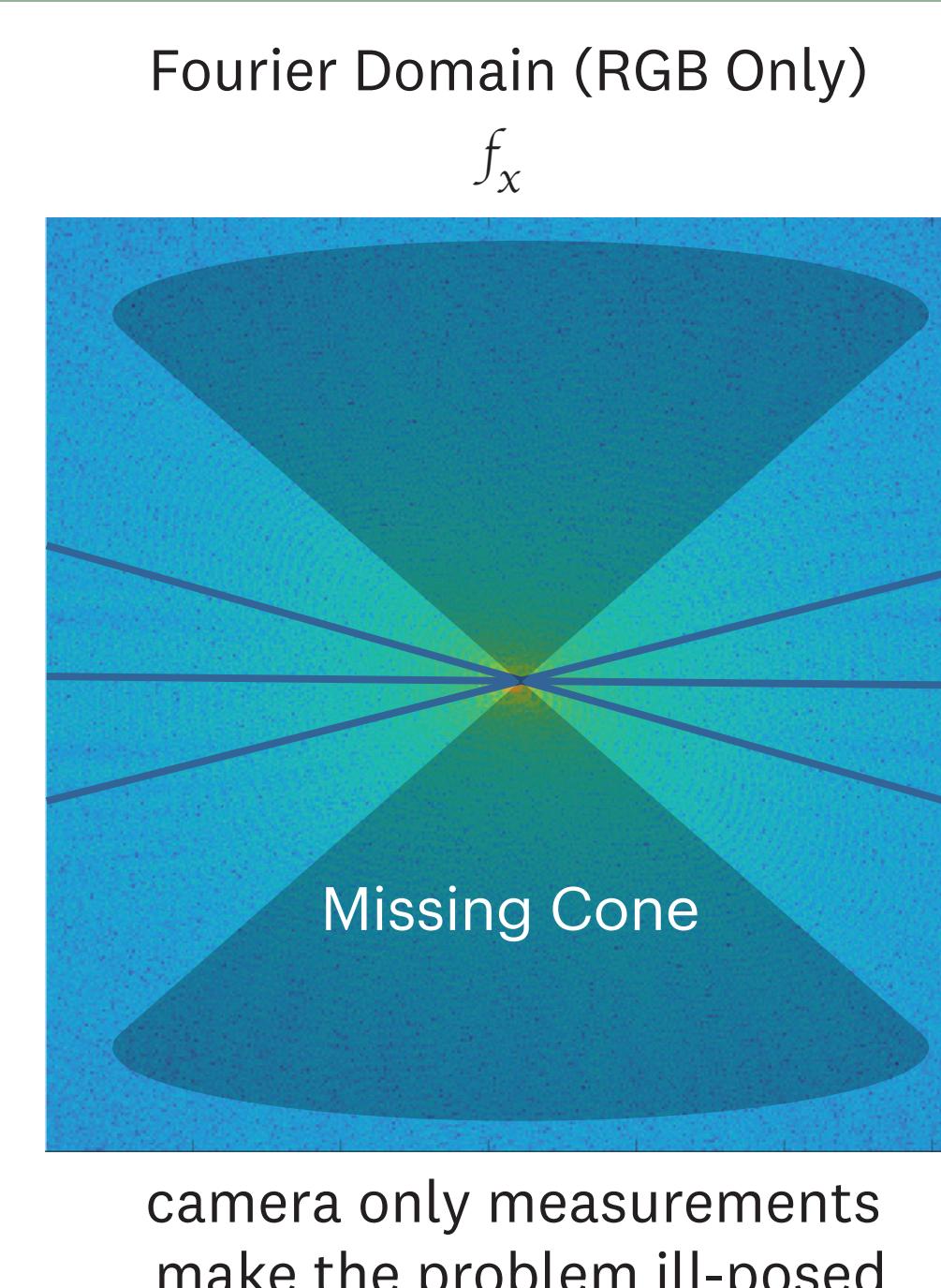
Small Baseline Scenario



- Solve the “missing cone” problem in the small baseline scenarios.
- Fuse camera and time-resolved measurement (e.g. sonar).
- Take the advantage of explicit representation and computationally efficiency from Gaussian Splatting.

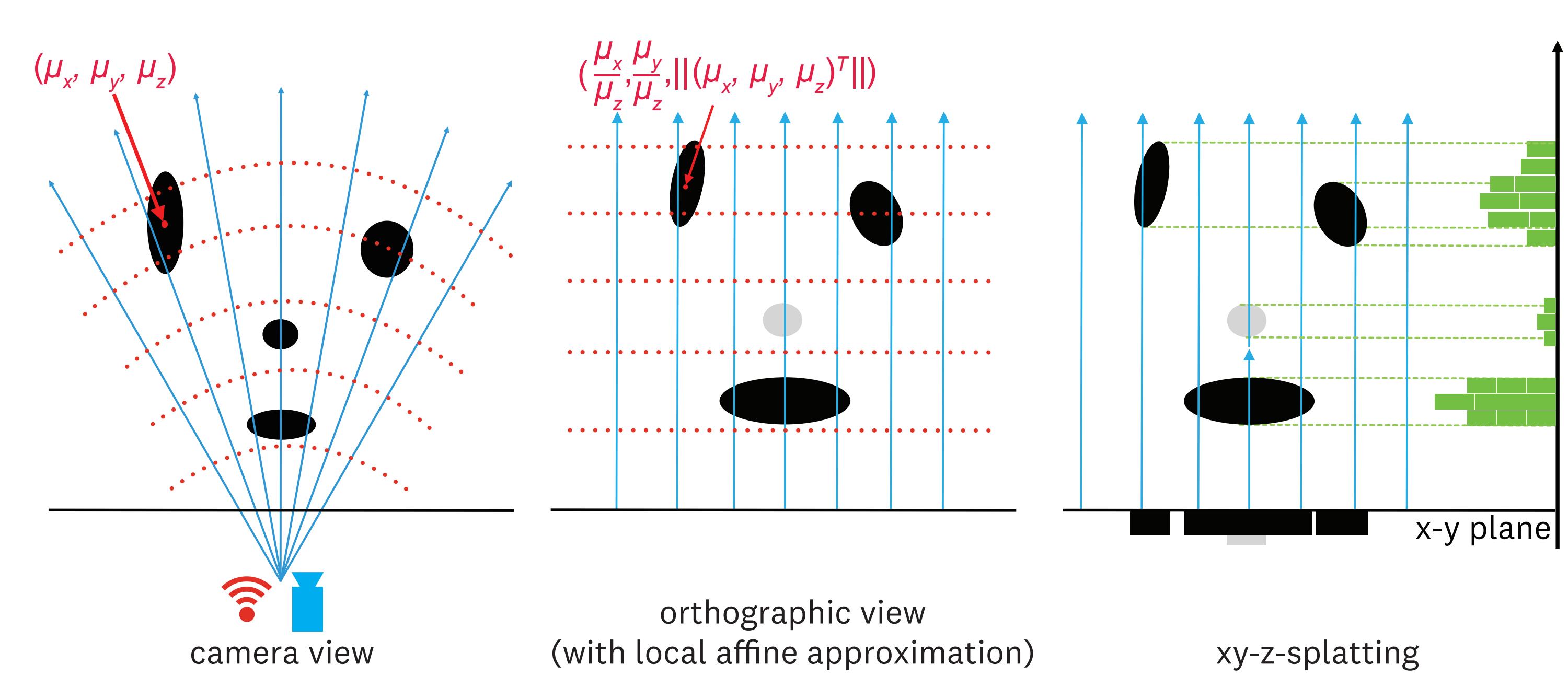


Missing Cone Problem

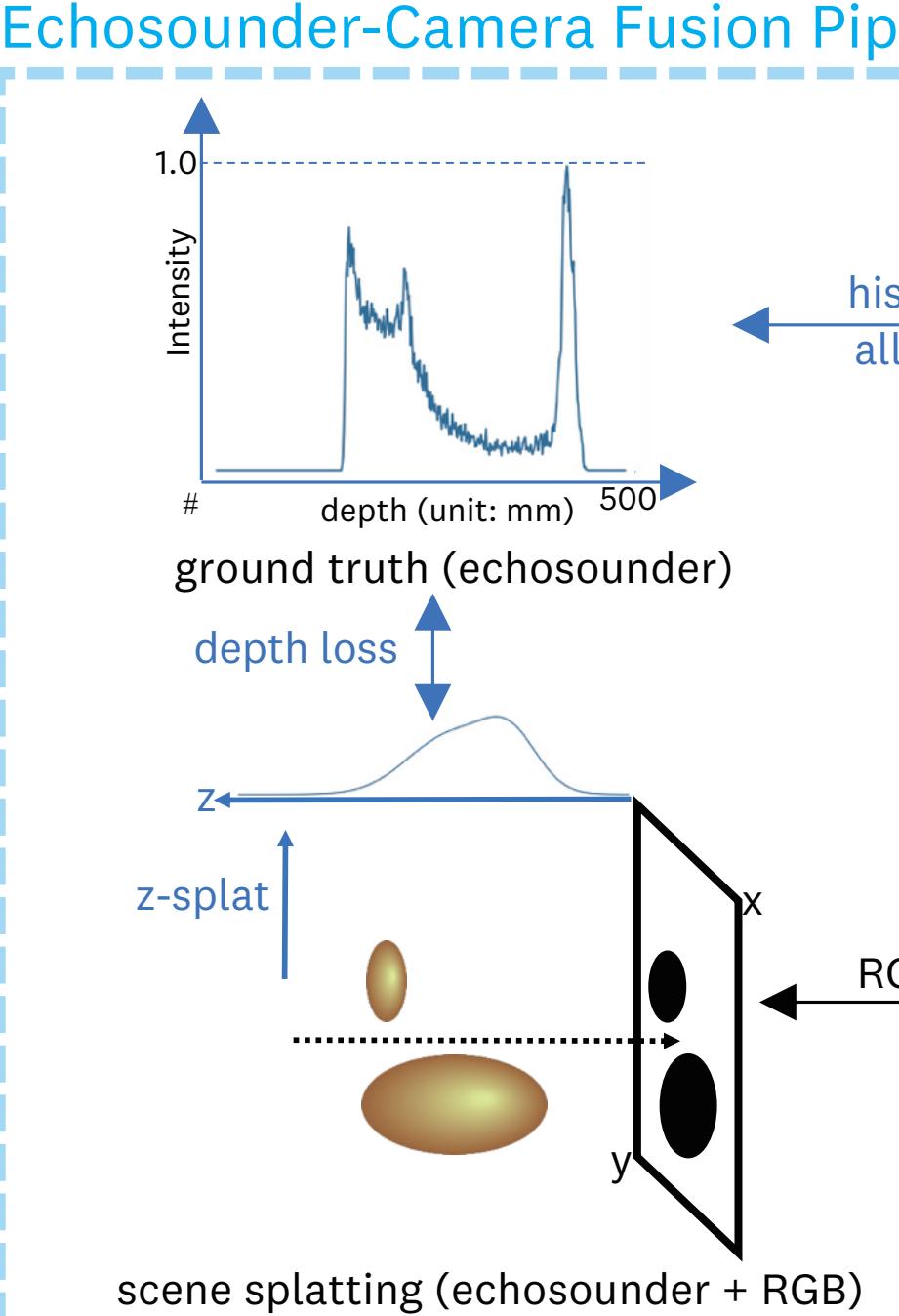


Method

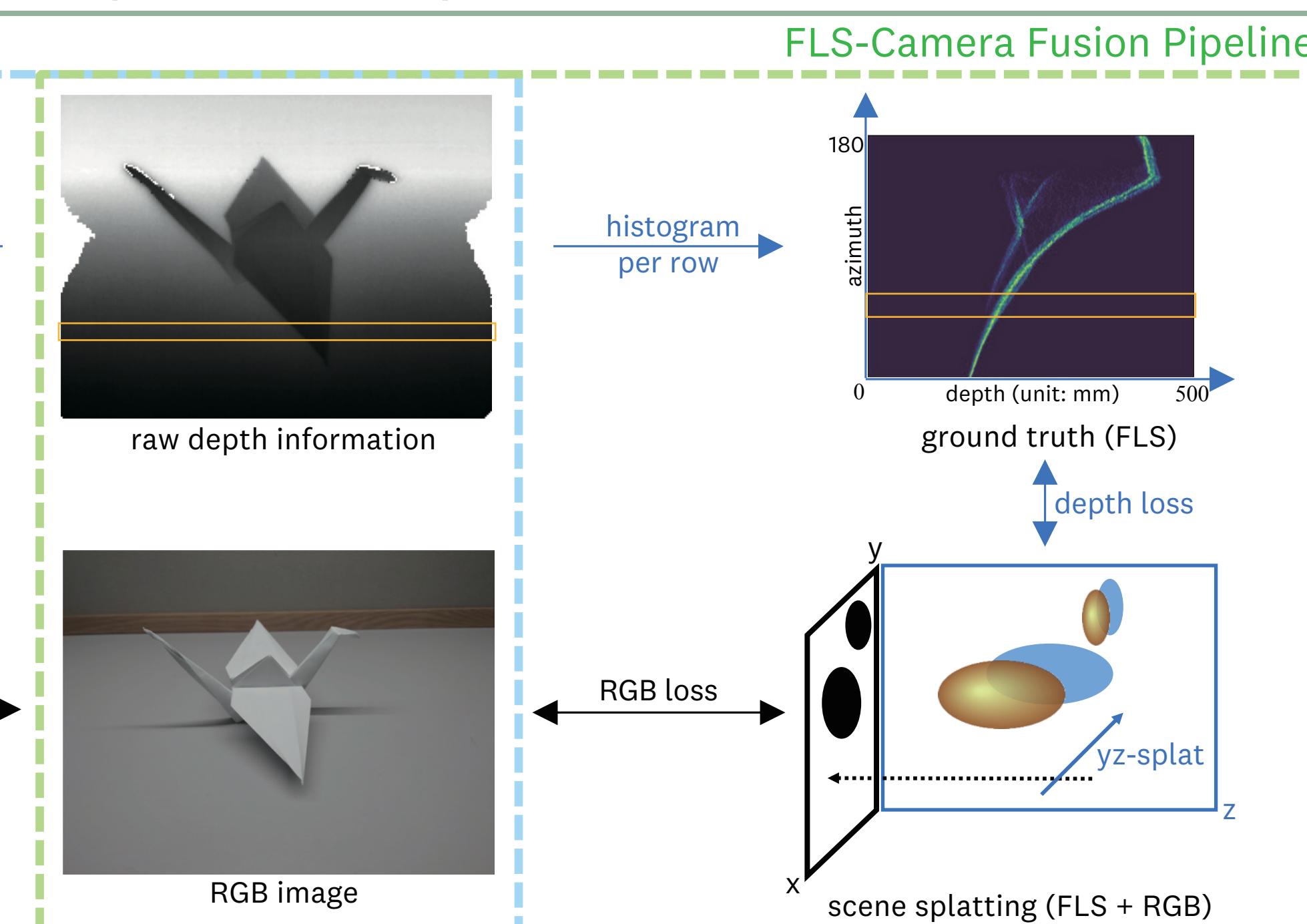
Splatting Operation



Echosounder-Camera Fusion Pipeline

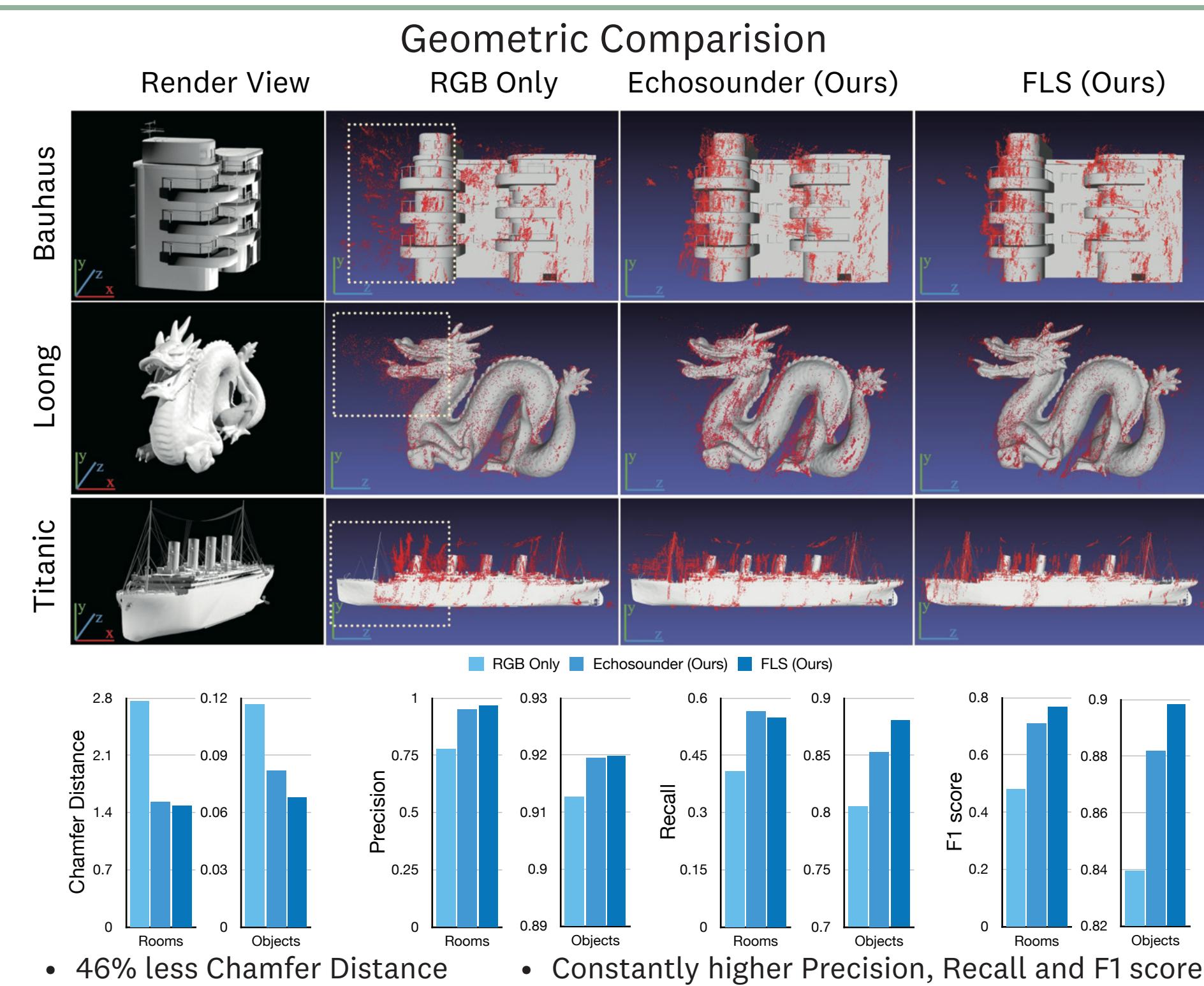
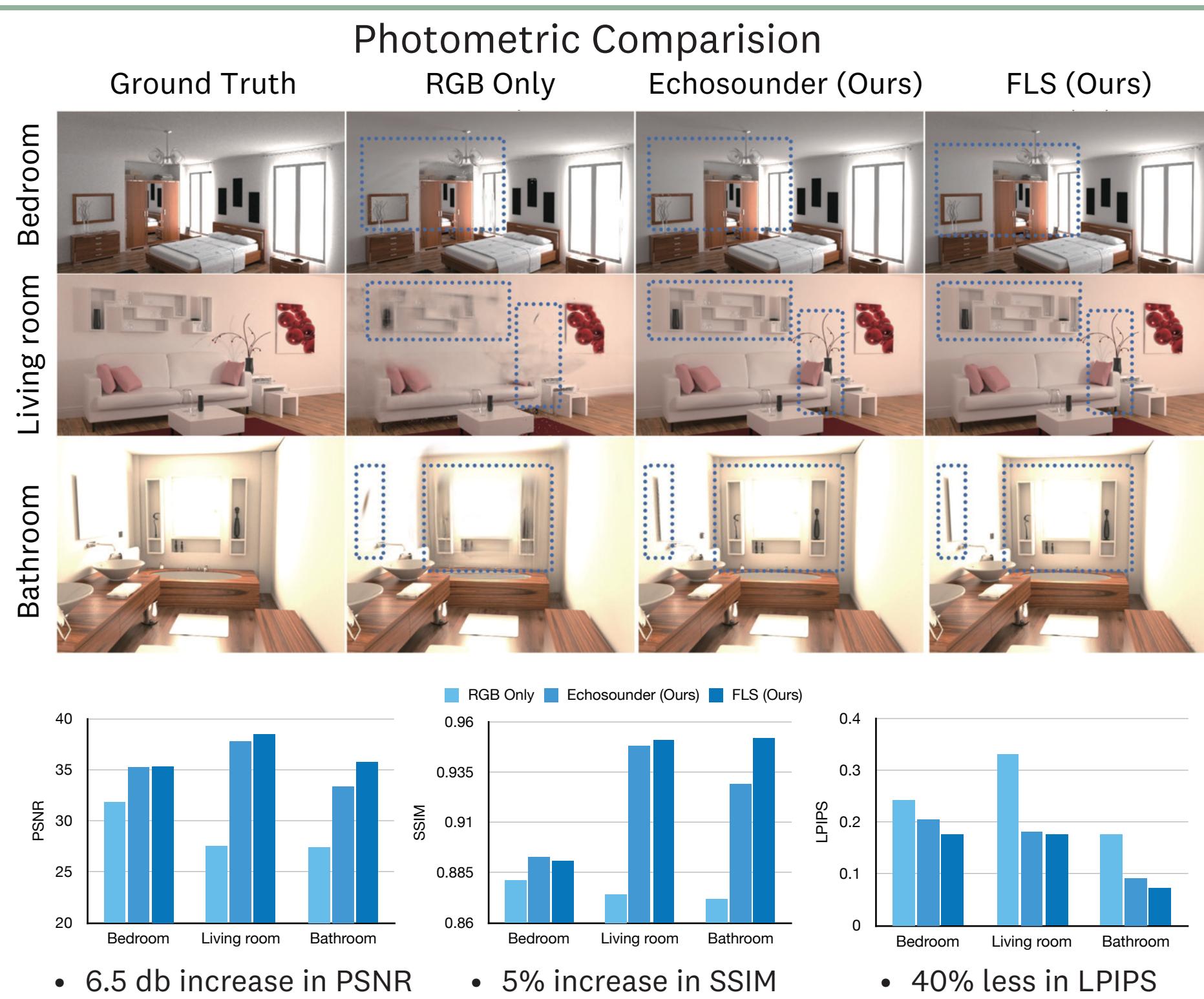


Experiment Pipeline

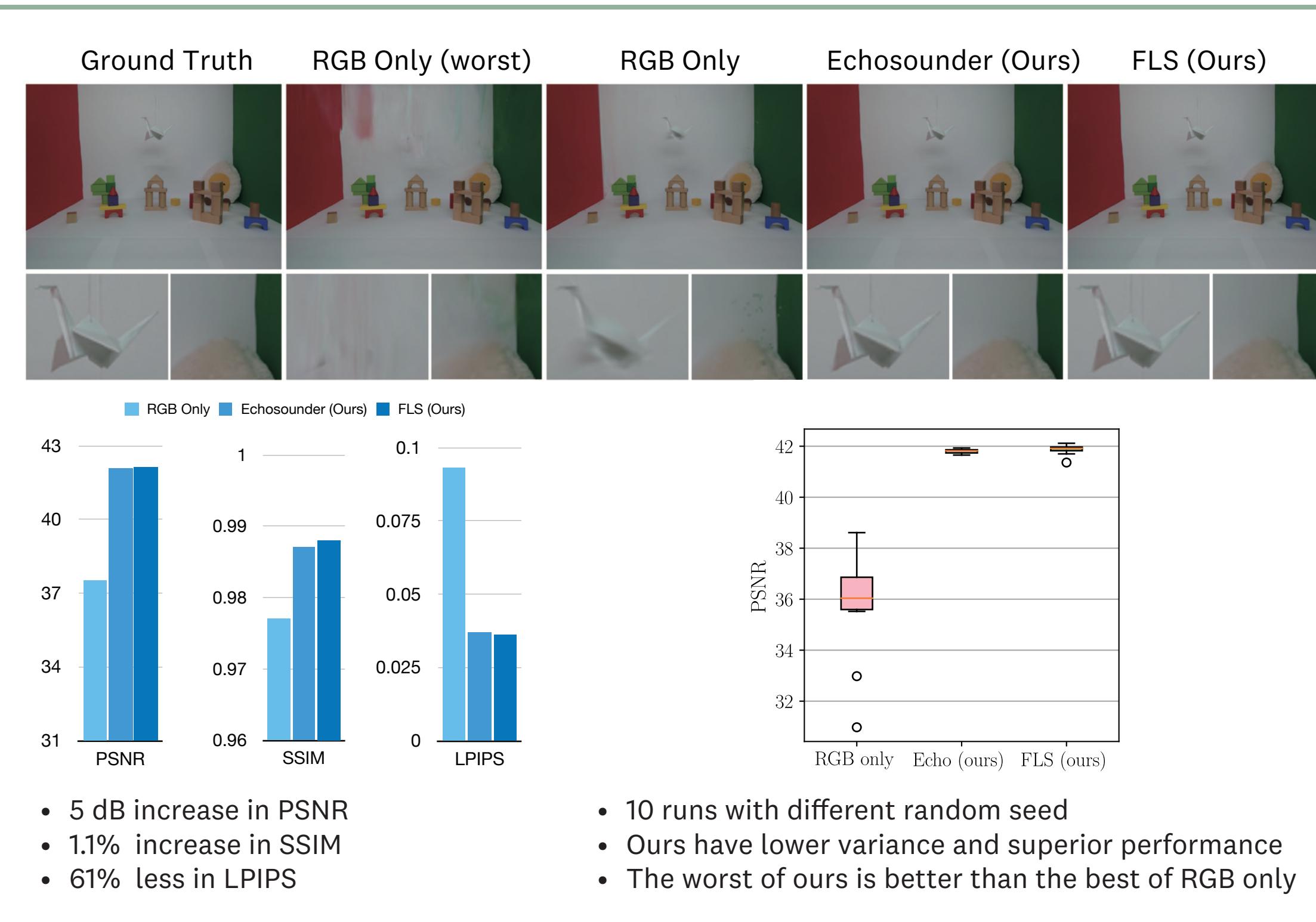


Experiments and Results

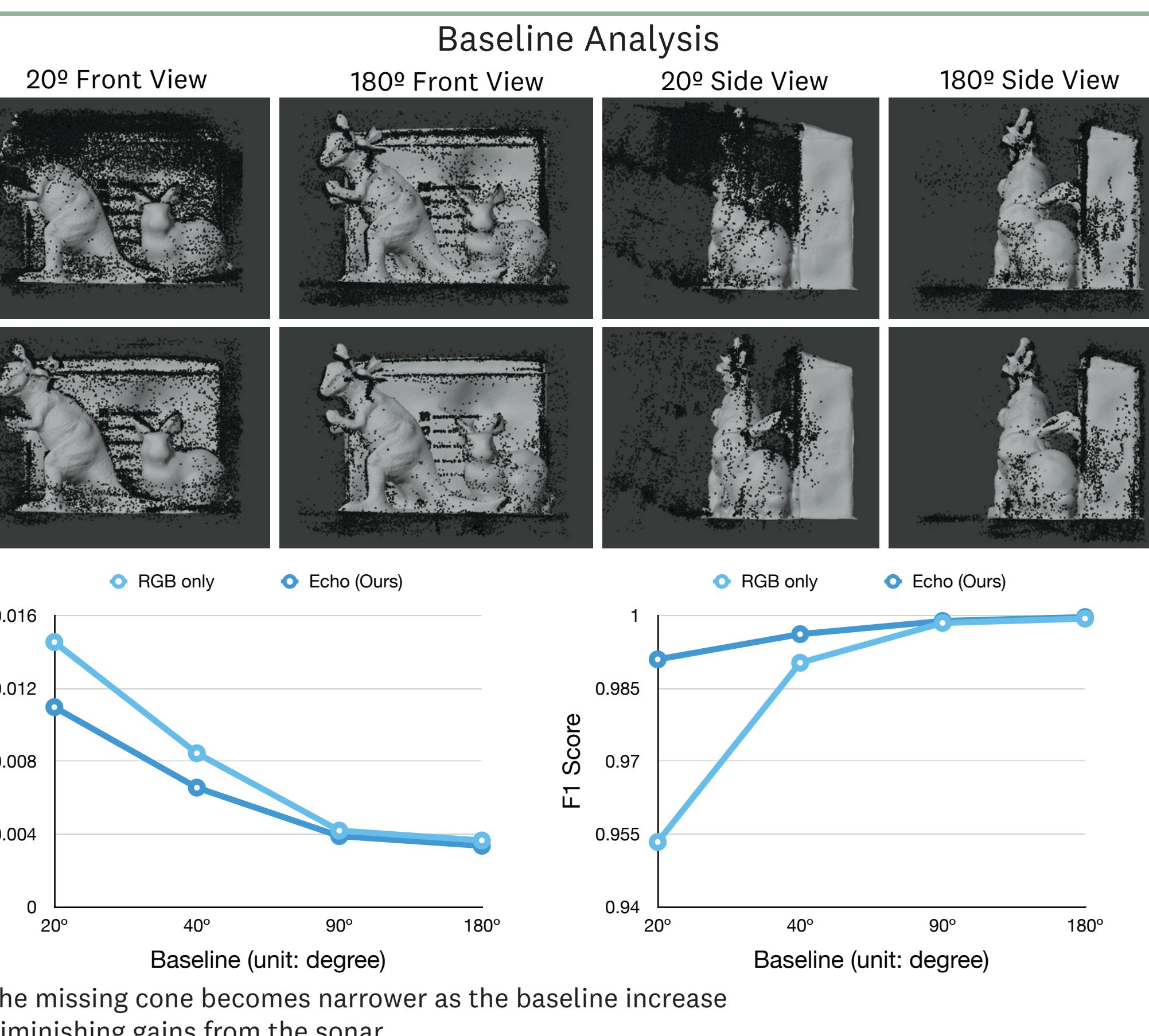
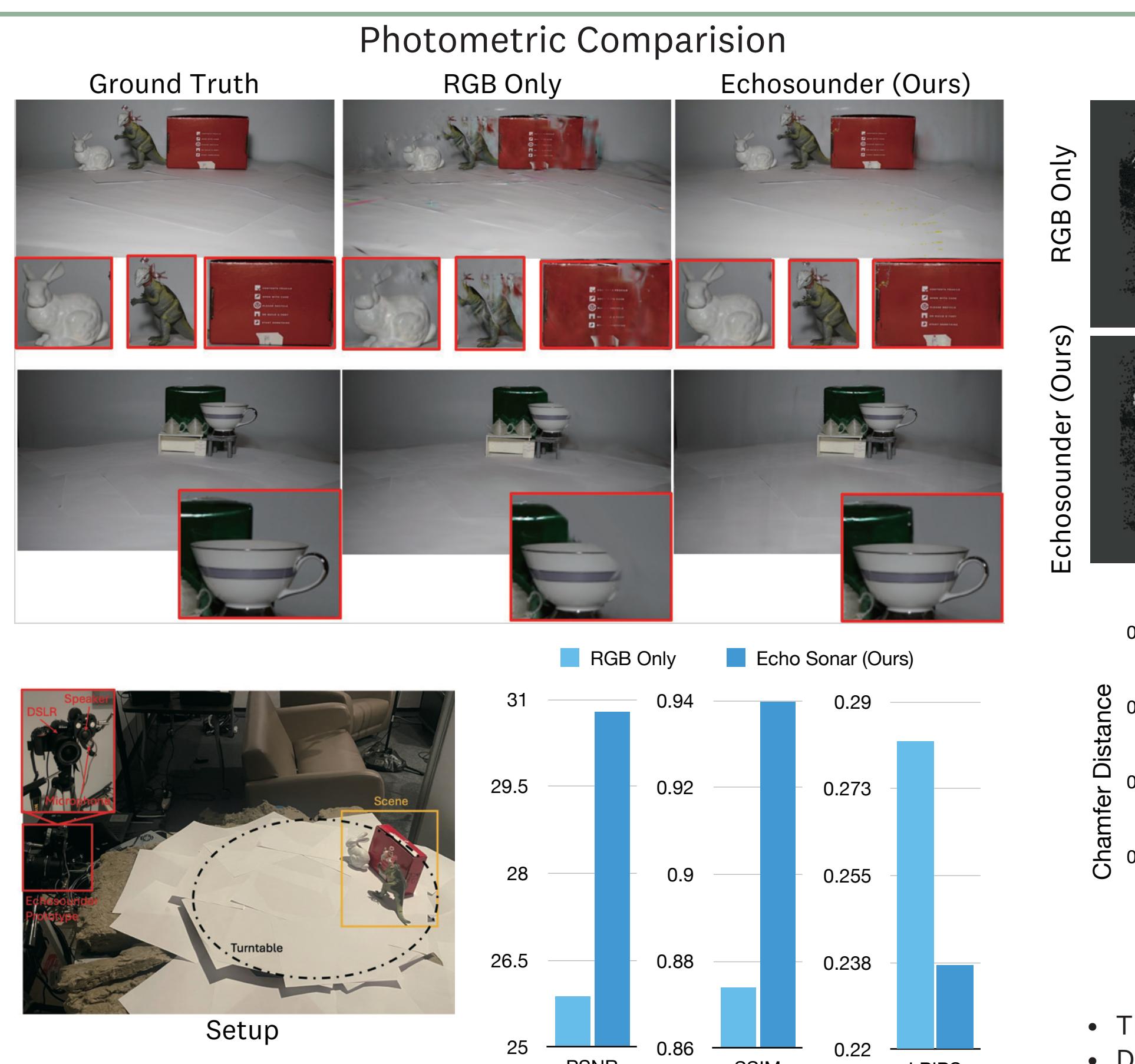
Simulation



Emulation



Hardware - Echosounder



Hardware - Forward Looking Sonar

