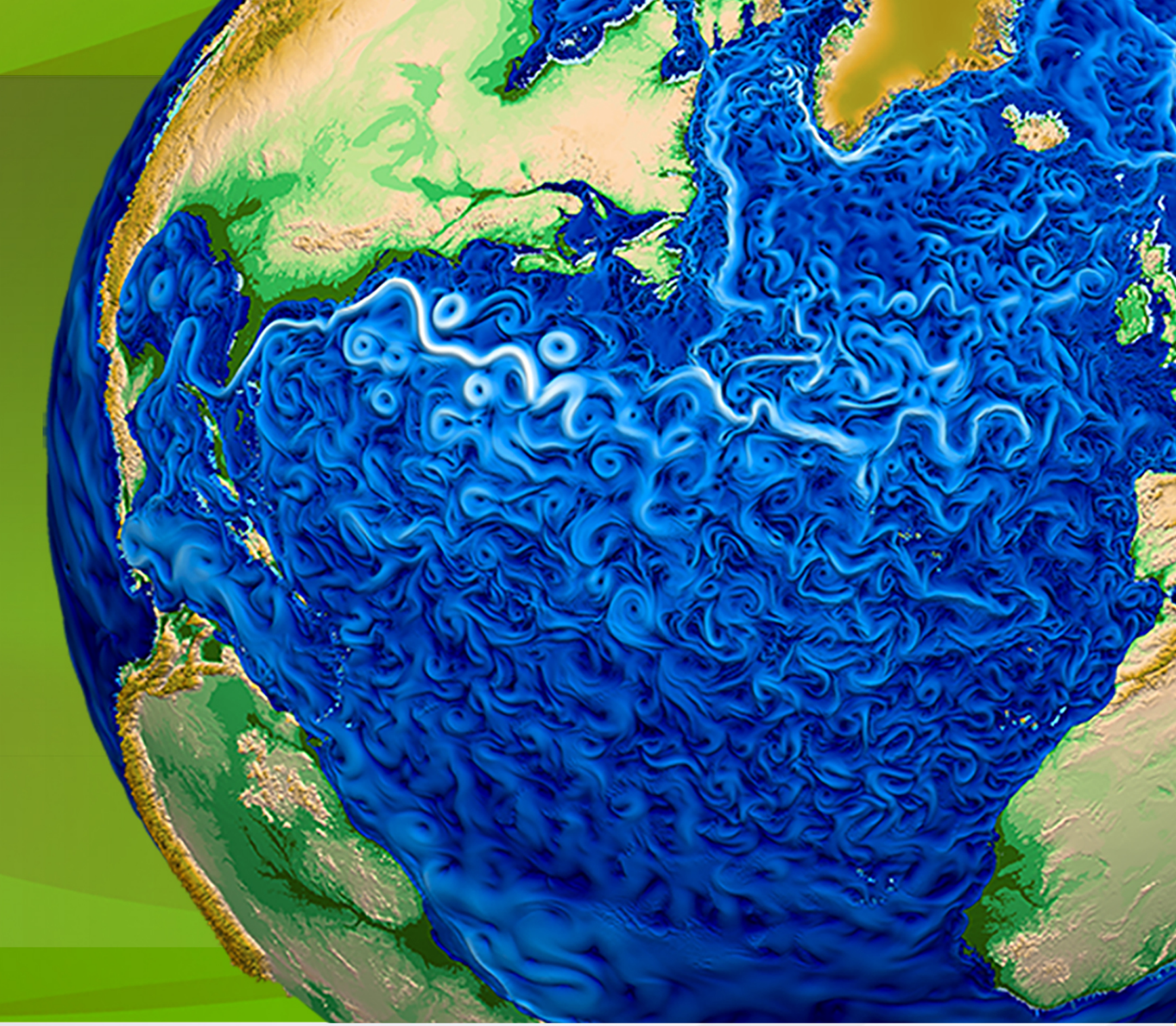


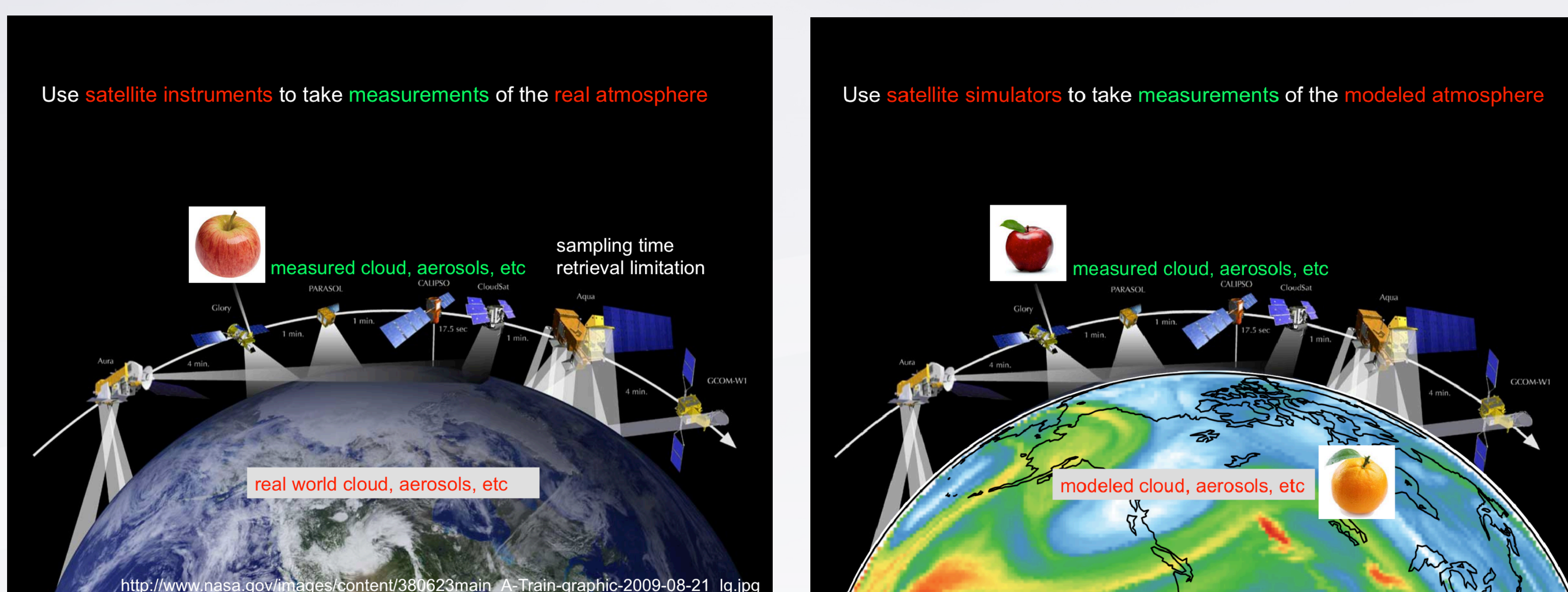
R: A New Aerosol Lidar Simulator

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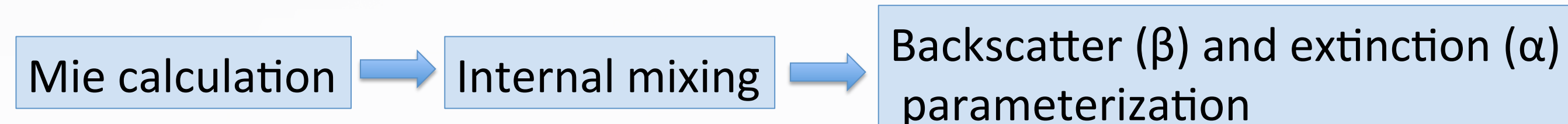
Objective



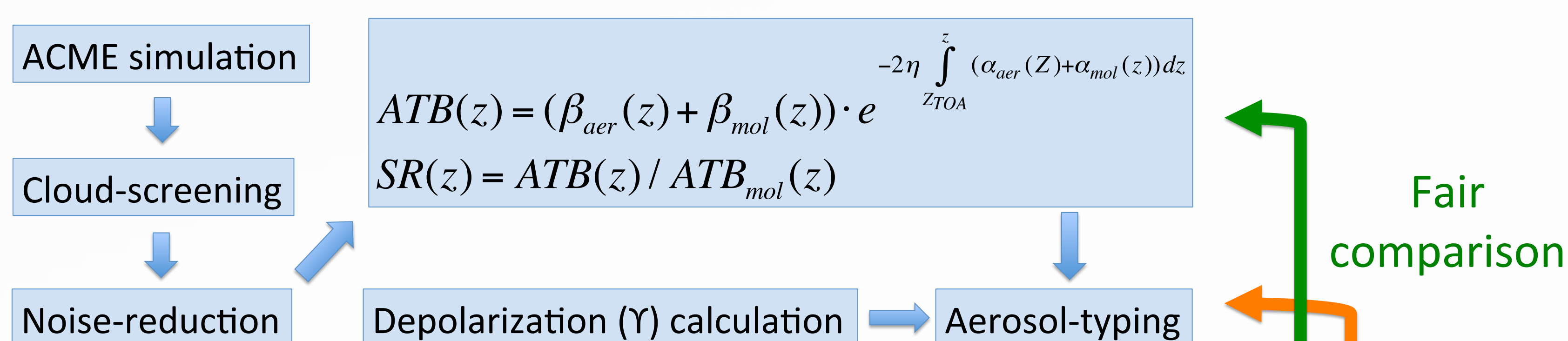
- Develop an novel simulator for aerosols
- Create a new CALIPSO data product for evaluating GCM
- Use cloud and aerosol simulators and the corresponding observational data products to evaluate/constrain the model aerosol-cloud interactions

Approach

- ACME aerosol optics



- Aerosol Lidar Simulator



- GCM-Oriented CALIPSO Aerosol Product (GOCAP)

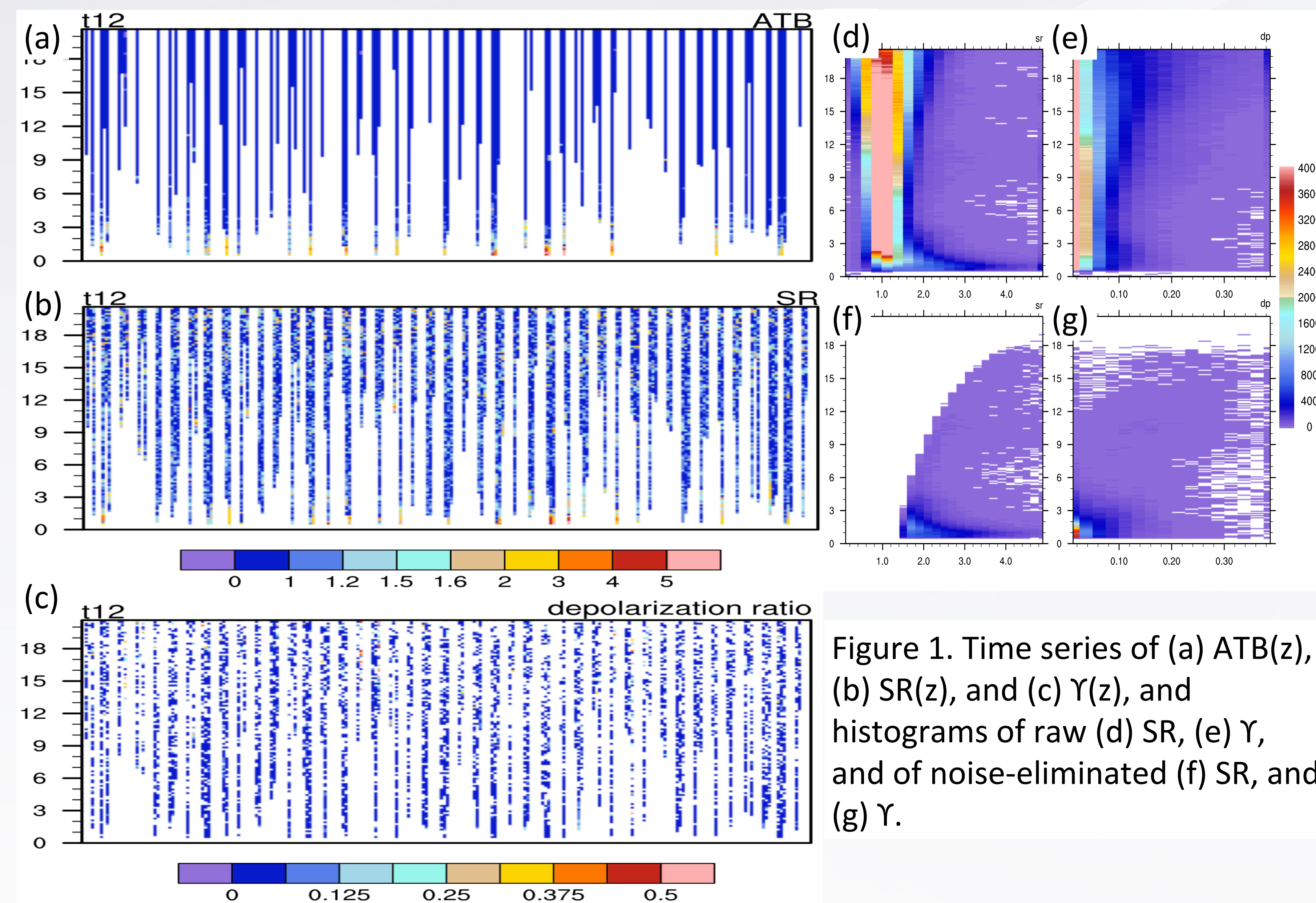
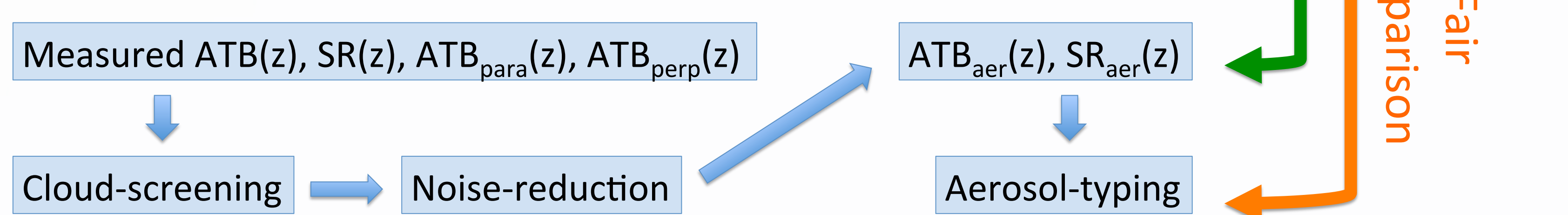


Figure 1. Time series of (a) $ATB(z)$, (b) $SR(z)$, and (c) $Y(z)$, and histograms of raw (d) SR , (e) Y , and of noise-eliminated (f) SR , and (g) Y .

Next Steps

- Produce nudged ACME simulations with the aerosol simulator for one year (2008), and evaluate/constrain the model against GOCAP
- Produce a multi-year GOCAP dataset to evaluate/constrain multi-year model simulations
- Produce a new collocated dataset consist of aerosol, cloud, and precipitation, and use simulators to re-evaluate the aerosol-cloud-precipitation interactions.
- Relate the "true" aerosol types from the model with the simulator typing algorithm
- Implement the simulator for the 1064nm backscatter to evaluate/constrain model size and composition
- Coordinate with CMIP for model intercomparison
- Use ARM ground-based lidar observations and CRM/LES simulations to evaluate/constrain GCM's satellite-oriented simulator results