Response to reviewer 2

General comment

I prefer to keep the title as is, because it reflects the main goal of the paper. The comparison of different instrument types for clear sky retrieval is the first step toward this goal. Namely, since already multi-angle photo-polarimetric measurements are needed for full aerosol characterization under clear sky conditions, I believe it makes sense to perform the simultaneous aerosol-cloud retrieval only for this measurement type.

Specific comments:
1. In the revised version, the explanation is given in the caption of Table 1.

2. The equations are replaced by equations without the geometrical cross section. Also, it is now stated that for non-spherical particles radius refers to the radius of a volume equivalent sphere.

3. The following explanation is included: *'Coefficients for the spectra of the real- and imaginary part of the refractive index are considered as unknown parameters. This means that per mode there are 8 unknown parameters related to refractive index (4 for the real part and 4 for the imaginary part). Thus, for a bimodal size distribution there are 22 aerosol (microphysical) fit parameters, i.e. 6 for the size distribution and 16 for the refractive index.*'

4. f is the cloud fraction for a given pixel. A discussion on 3-dimensional radiation transfer effects is included in the revised version. (see response to reviewers 1 and 3).

5. The definition of the averaging kernel is given in Rodgers (2000). In inversion theory literature (at least the part related to atmospheric remote sensing) the bold symbol $\mathbf{A}$ is common to use for this matrix.

6. The information is now included in the different figure captions.

7. In the revised version a discussion related to 3-dimensional radiation transfer effects is included.

8. The sentence is replaced by the following phrase: *'Since the biomass burning aerosol type is dominated by the small mode, the large mode only has a small contribution to the total AOT. This implies that the microphysical properties of the large mode cannot be retrieved with accurately, but also that in this case these parameters are of minor importance. Therefore, only results for microphysical properties of the small mode parameters are shown.*'

9. On p 1244 'Figure 2' has been corrected to 'Figure 3'.

Technical corrections have been applied.

The reviewer is acknowledged for his comments on the paper.