Supplementary material for:

The importance of surface reflectance anisotropy for cloud and NO$_2$ retrievals from GOME-2 and OMI

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Figure S1: Google Earth image of the Amazon region (Lat.: 5N-10S and Lon.: 70W-60W) analysed in the manuscript.

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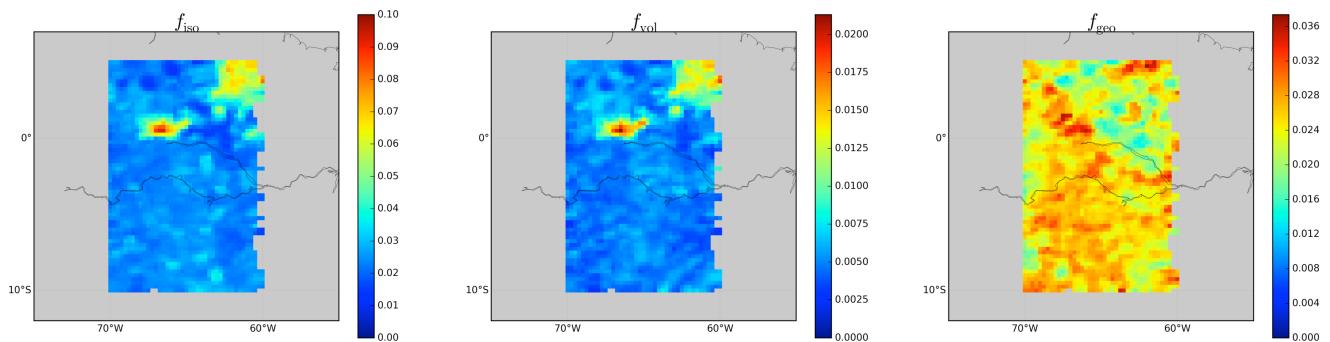
Figure S2: Monthly averaged BRDF parameters (f_{iso}, f_{vol}, f_{geo}) from MODIS Band 3 (459-479 nm) averaged over the Amazon in a 0.25° x0.25° grid for March. BRDF parameters are from a 16-year climatology (2000-2016) created by the QA4ECV land group.

35   **Figure S3:** Same as Fig. S2 but for Band2 (841 - 876 nm)

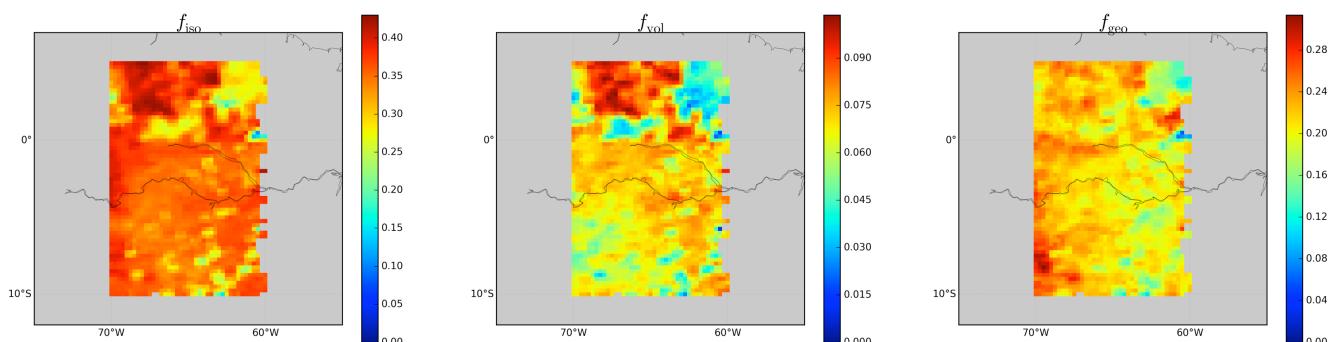



Figure S4. Box-plot of simulated cloud fractions with a Lambertian surface (blue) and with surface BRDF (green) for GOME-2A East, Nadir and West measurements over Amazonia for March 2008. Triangles and circles show the mean values and the box represents 25th and 75th percentiles and the dashed lines the minimum and maximum values.

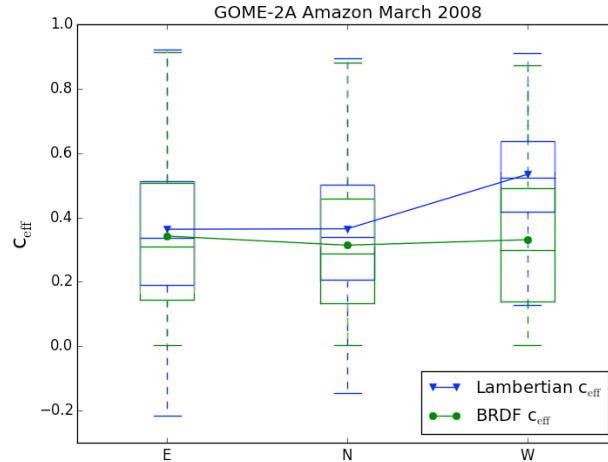



Figure S5. Relative differences between total tropospheric NO_2 AMF computed with surface BRDF and with a Lambertian surface as a function of cloud fraction for (a) backward scattering direction and (b) forward scattering direction for $(\theta, \theta_0) = (30°, 45°)$ for a moderately polluted (circles) and unpolluted (squares) troposphere. Surface BRDF parameters are $(f_{iso}, f_{vol}, f_{geo}) = (0.04, 0.03, 0.008)$ and $A_{ws} = 0.036$ for the Lambertian surface.