

Referee comment on “Analysis of a saline dust storm from the Aralkum Desert – Part 1: Consistency between multisensor satellite aerosol products” by Xin Xi et al.

The authors’ revisions to the paper are substantial and worthwhile, adding to the analysis MISR multiangle visible AOD retrievals and multiple infrared AOD retrievals from IASI, as well as dust aerosol height retrievals from both MISR and IASI. It is now an extensive multisensor inter-comparison study with its focus on the Central Asian region, which makes for a more compelling paper overall. An advantage of including the MISR retrievals is that alongside the AOD the MISR retrieval algorithm also estimates the non-spherical dust contribution, the fine mode fraction, and the single scattering albedo, all of which provide additional insights when considering dust activity in the vicinity of the Aralkum where it is to be expected that saline dust may contribute to the overall dust burden. In general it seems to be a well-argued response by the authors to the reviewers’ and the commenter’s points.

The MISR AOD analysis in the new Figure 9 seems to me to be a substantial extra contribution in this updated manuscript version. Figure 9 addresses very effectively my main critiques of the previous version as to an apparent shortage of investigations of the aerosol type (i.e. saline dust) and of dust retrievals in the immediate vicinity of the Aralkum. In particular it is very interesting to see the performance of the Research Aerosol algorithms with respect to the operational retrieval output that is more widely used.

The addition of the IASI AOD and altitude retrievals, as well as the MISR altitudes, is also a positive contribution to this updated manuscript. Including infrared retrievals highlights further the wider range of available satellite dust aerosol retrieval algorithms, and in Figure 14 these appear to display potential advantages over the Aralkum region.

As a more specific comment/question to Figure 9, it looks to me as though the RA retrievals are being performed over some of the water bodies in the vicinity of the Aral Sea? Comparing with the satellite image in Figure 19 it looks as though there are RA retrievals over the remaining waters of the South Aral Sea (west and east) and over the lake on the border between Uzbekistan and Turkmenistan. The main areas without retrievals appear to be the areas of the Aral Sea lakebed in the immediate vicinity of the remaining lake. In any case, the RA retrievals appear to be a clear improvement over the operational product in this region.