Cluster Ion Spectrometry (CIS) data quality indexes as a support for analysing magnetospheric measurements

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The Cluster Science Archive (CSA) aims at preserving the complete set of the measurements collected by the four Cluster spacecraft, so that they are usable in the long-term by the world-wide scientific community as well as by the instrument teams. This implies that the instrument data, properly calibrated, are filed together with the descriptive and documentary elements making it possible to select and interpret them. The CIS (Cluster Ion Spectrometry) experiment is a comprehensive ionic plasma spectrometry package onboard the Cluster spacecraft, capable of obtaining full three-dimensional ion distributions (about 0 to 40 keV/e) with a time resolution of one spacecraft spin (4 sec) and with mass-per-charge composition determination.

For the archival of the CIS data a multi-level approach has been adopted. The CSA archival includes processed raw data, moments of the ion distribution functions, and calibrated high-resolution data in a variety of physical units. The latter are 3-D ion distribution functions, 2-D pitch-angle distributions and 1-D omni-directional fluxes. The CIS data archive includes also experiment documentation, graphical products for browsing through the data, data caveats and data quality indexes. The later constitute a novel product, which has been prepared in order to help the user asses the quality of the data acquired in different magnetospheric regions and during various operational modes. It provides information on which are in each case the issues that can affect the data quality, which are the data products affected, and gives a simple quantitative measurement of the severity of these issues.

The principle of the CIS data quality indexes will be described and the various issues, that can under some conditions affect the data quality and are thus taken into account in generating the data quality indexes, will be discussed.