Theoretical basis and examples of Global Sea Products (Level 3) for MWR.

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INTRODUCTION

SAC-D/Aquarius mission was designed to provide weekly global map of sea surface salinity. In this way MWR has the capability to produce these kind of information for its retrieved geophysical variables.

The retrieved geophysical products (L2) of Sea Ice Concentration, Water Vapor and surface Wind Speed, are being generated and delivered regularly, since more than one and a half year, by Conae User Service Segment.

Until this moment, the only global product (L3) operative using MWR data is the corresponding to Sea Ice Concentration (SIC). In this work we show these operative L3 products and preliminary global products for the columnar Water Vapor (WV) and surface Wind Speed (WS).

Antecedents of Global products

There are many different ways to generate a global coverage product (L3) for satellite sensors [1] [2]. In general, these are generated by the use of a set of L2 products of the same or related variable, making a statistical processing of the data on a grid, taking into account physical properties of these variables. In this way, the election of the grid is one of the most important issues to be fixed for the L3 product generation, not only for the processing of the data itself but also for the final product for the users.

The lapses of time often used are daily , weekly and monthly, being the last one very used for climate studies.

L3 Sea Ice Concentration

Figure 1 shows a flow diagram to describe the general processing for obtaining weekly and monthly IC.

After the selection of passes to process the data are put in a Geodesic Grid developed by Colorado State University [3] (Figure 2).

Then, the data are rearranged to optimize the processing. On each grid cell is calculated the mean, the mode, and the standard deviation. In the final product, outlier data have been eliminated previously to calculate these statistical quantities.

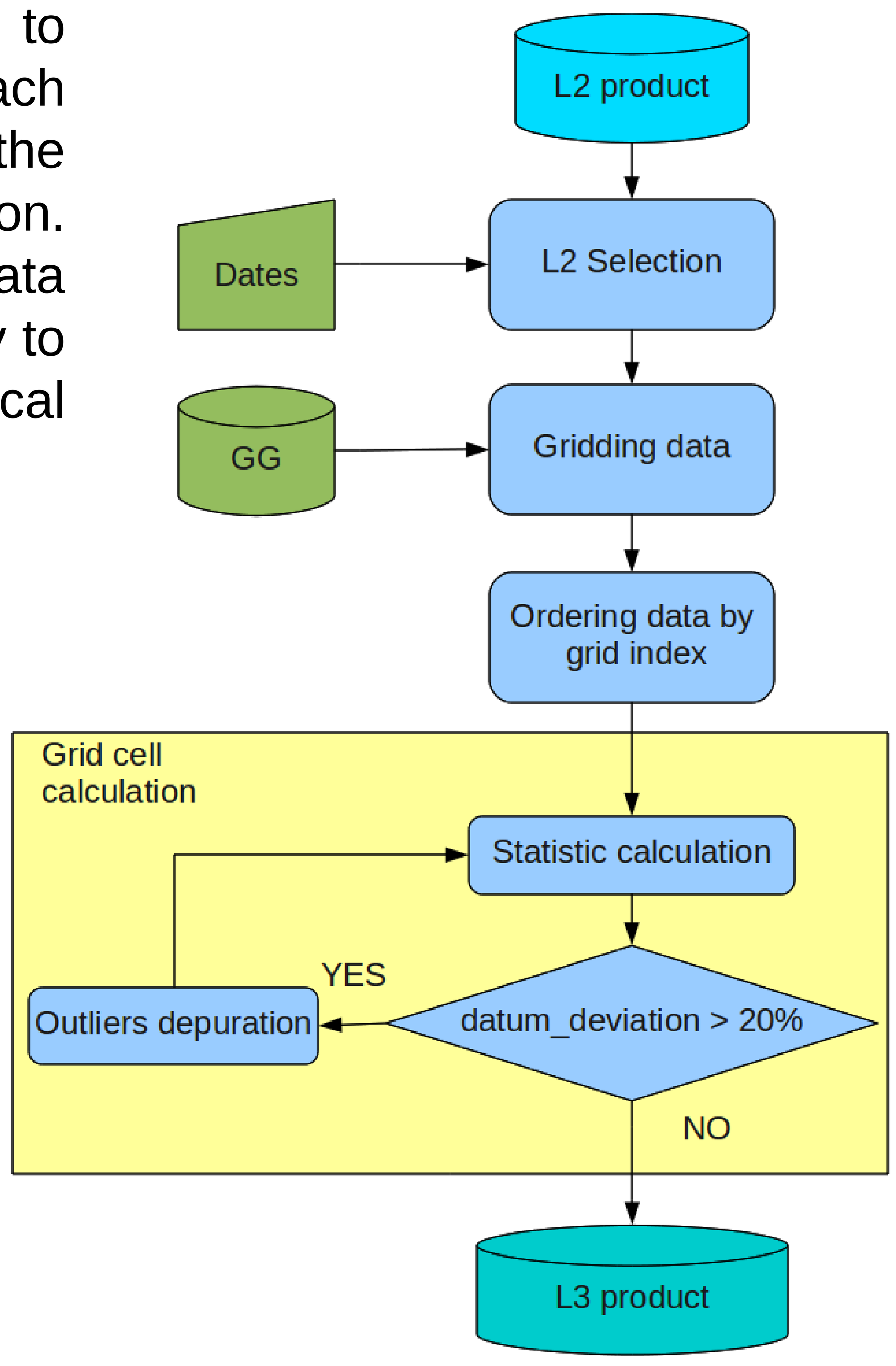

Figure 1: Conae L3 production escheme

Output format for SIC L3

• hdf5 format for data on the Geodesic Grid.

• geotiff for data projected on polar projections of NSIDC[4].

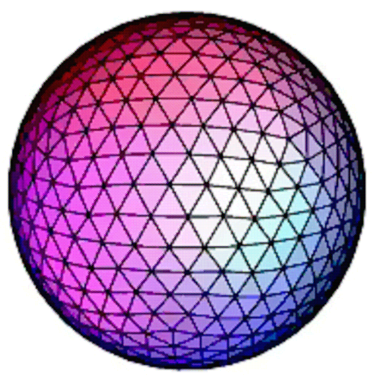

Figure 2: Geodesic Grid of 642 points

Output format for WV and WS L3

• hdf5 format for data on the Geodesic Grid.

• geotiff for data on a cylindrical equal area projection (EASE grid)[4].

Examples of L3 SIC

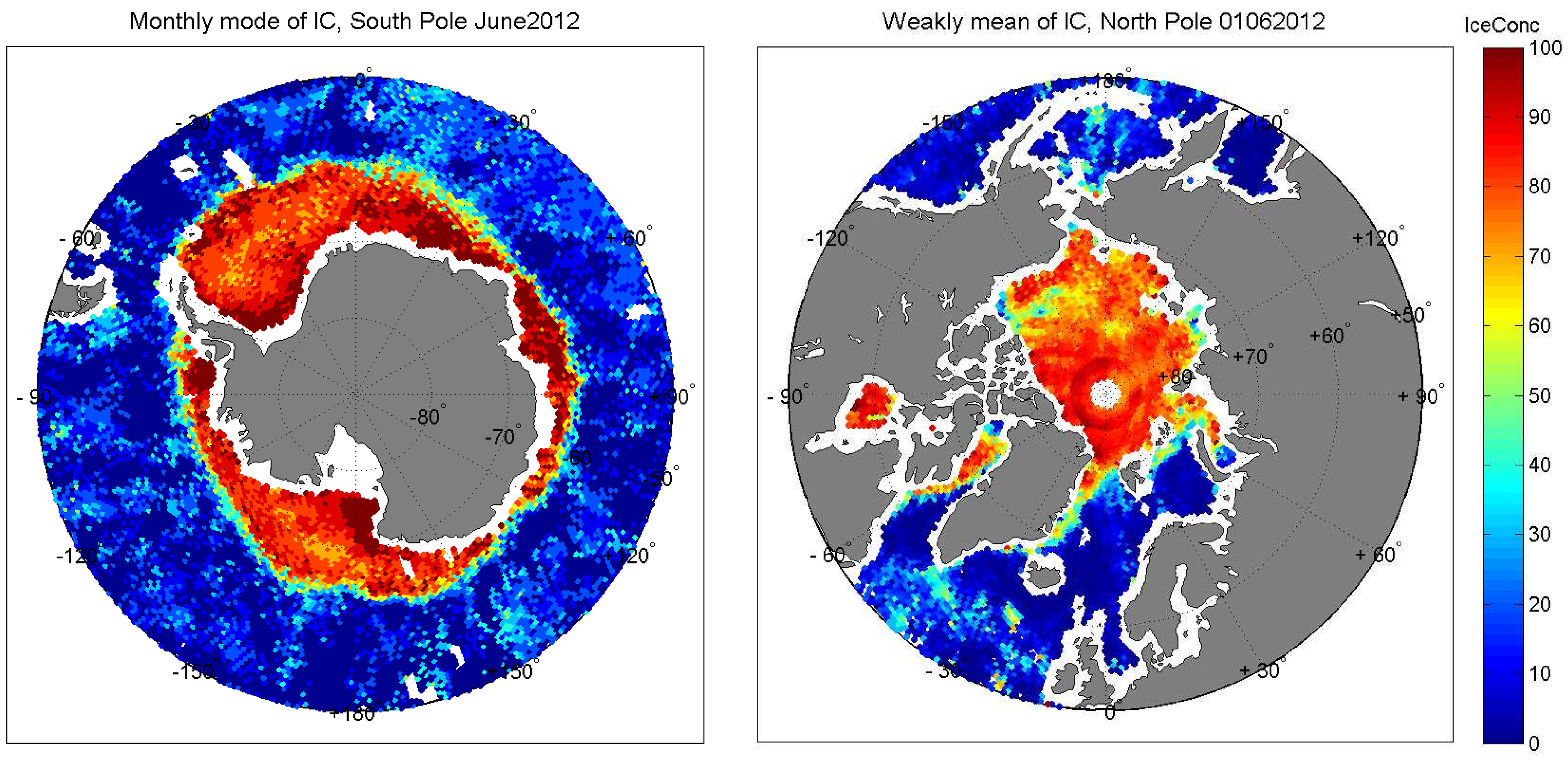

Figure 3: Examples of SIC L3

Prototypes of L3 for WV and WV

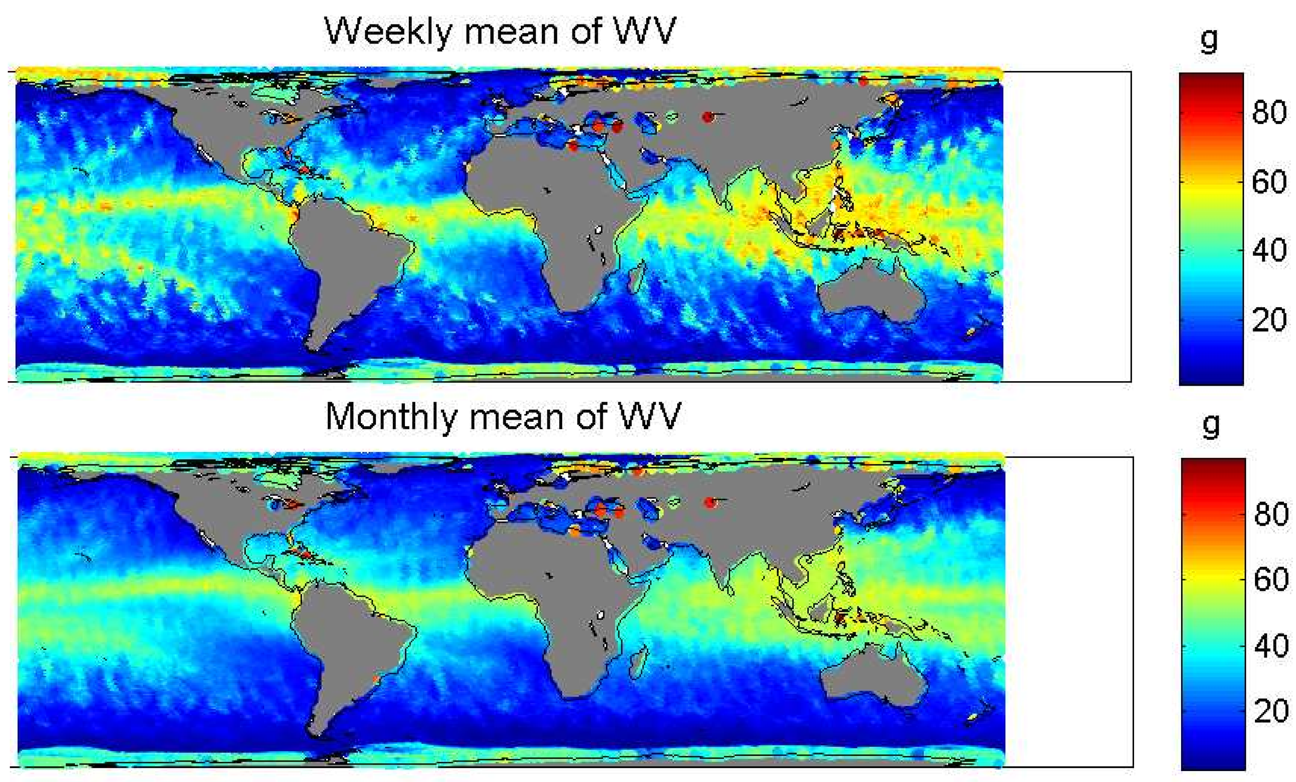

Figure 4: Examples of L3 of Water Vapor

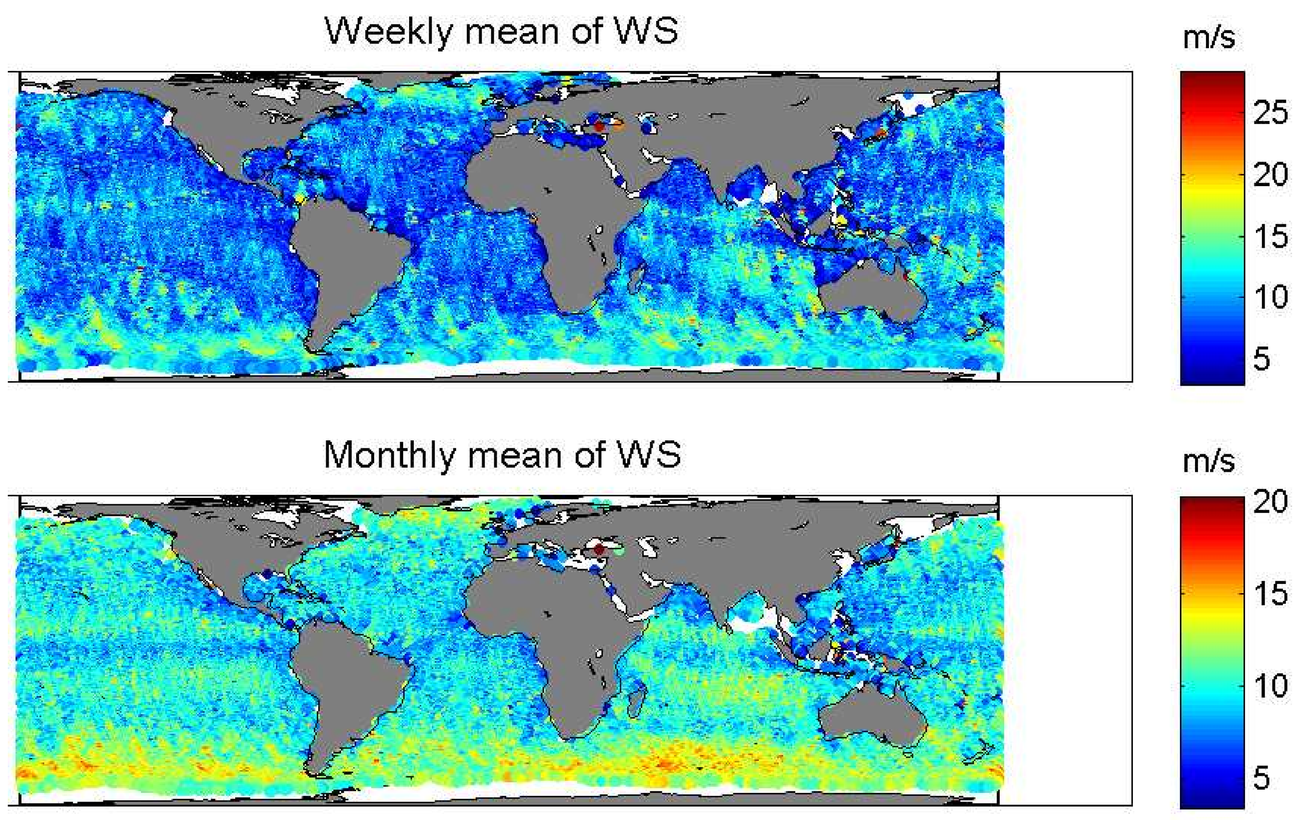

Figure 5: Examples of L3 of Wind Speed

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