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GOCEPARSER - A program to parse GOCE level 1b and level 2 data

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Since its launch on March 17th 2009, ESA's GOCE mission continuously provides huge amount of gravity-related data in terms of high sensitive gradiometer measurements together with GOCE high precise orbits and other ancillary data. After only one few months repeat cycle of GOCE mission, the first GOCE gravity models became available to the geodetic community. GOCE data products of Level 1b and level 2 are summarized in the well known ESA GOCE mission documentation. ESA provides these data sets packed in the xml format. This paper deals with the algorithms for reading, extraction and usage of these data sets. Since xml is mainly designed for relatively small data sets, most of the xml parsers use computer memory to copy the data contained in the xml files and then loop over this data in memory and extract the desired information. Applied to GOCE products data size and amount, this means that one needs lot of memory to store this data and also that for single record search loop over all data stored in the memory might be necessary resulting in relatively large CPU time. In this paper we introduce method to extract fast the GOCE level 1b and level 2 data from the xml files. Compared to already available xml parsers and xml parsing libraries, it performs 400 times faster and makes GOCE xml data processing fast and reliable. The program is tailored to GOCE xml data structure and is not a general xml parser. It does not copy the huge xml files into memory but extracts the data from the xml files by fast algorithm taking into consideration the definition of how GOCE products are packed in the xml files from the ESA GOCE documentation. The program performs well for the data defined in the GOCE documentation. However, if ESA decides in the future to add additional data in the xml files, then update of the software is necessary. The GOCEPARSER program is freely available to the GOCE data- users community from the author.