**Deliverable D1.1: Report ‘Campaign requirements’**

From: University of Bremen, Institute of Environmental Physics

Date: 30 September 2016

To: EUROPEAN SPACE AGENCY (ESA)

The European Space Research Institute (ESRIN),

Via Galileo Galilei,

Casella Postale 64,

00044 Frascati (Roma),

Italy

***Att.: Sara Pancotti***

Subject: ESA-IPL-POE-LG-cl-LE-2015-1129

Title: Fiducial Reference Measurements for Ground-Based IR Greenhouse Gas Observation (FRM4GHG)

Category: ESA Express Procurement (EXPRO)

Our ref.: Proposal No. 1129/2015 –

Proposal from February 16, 2016 plus comments from May 27, 2016

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dear Sir or Madam,

With reference to the above Request for Proposal (RFP), please find our report on the ‘Campaign requirements’ (D1.1) to be delivered at T0 + 2 month. If you have further questions, please let me know.

Regards

Justus Notholt

The following report describes the campaign requirements which are essential to perform a successful campaign. The report, listing all deliverables together with their timeline and responsible persons is given in D7.1 ‘Project Management Plan’, which will be delivered in parallel at T0+2.

The campaign will be performed in Sodankyla/Finland at the site where the FMI is performing TCCON observations since January 2009. The TCCON instrument is installed in a dedicated container. This instrument will serve as reference for all other spectroscopic observations.

All other spectrometers of FRM4GHG, the Bruker Vertex70, the Bruker EM27, the Bruker IR cube, and the heterodyne spectrometer will be installed in a separate 20 feet container. The container has been purchased and paid by FMI for FRM4GHG. All spectrometers will be placed on tables inside the container. One commercial Bruker solar tracker from BIRA will be mounted on the top of the container, feeding a parallel light-beam on the entrance of the Bruker Vertex70. The other instruments, the Bruker IR cube and the heterodyne spectrometer, have their own homemade solar tracker, which will be placed on the top of the container. The container has already the required holes in the ceiling. The Bruker EM27 with its solar tracker is a stand-alone instrument, which will be taken out by a technician on site during the measurements. All solar trackers have an active feedback, which means they are driven by active quadrant diodes, or by active camera positioning.

The active measurement campaign is planned to take place between March and November 2017. Spectra will recorded between sunrise and sunset, depending on the SZA limits and weather conditions (clouds). It will not be possible that all instruments run completely simultaneously, but all spectrometers are planned to get the diurnal cycle, so that a meaningful analysis can be done. In total three (??) Aircore balloon launches are planned, one shortly after the beginning of the campaign, so that the vertical profiles can be used in the retrieval, one at mid-term, and one about one or two month before the campaign ends. However, the exact launch dates will depend on the atmospheric situation, dynamics, which might lead to a shift of the launch dates. This will be discussed in close cooperation with all partners and ESA.