

Next generation of laser heterodyne radiometer (NexLHR) for ground-based remote sensing of greenhouse gas (GHG) concentrations directly from the Sun

Ground-based measurements of vertical profiles of greenhouse gas (GHG) concentrations in the atmosphere provide a better understanding of air pollution, ozone destruction and climate change as well as a means of validating chemical modeling and satellite observations. To this end, laser heterodyne radiometer (LHR) offers significant advantages in terms of high spectral resolution, high sensitivity and high vertical resolution in conjunction with a compact instrument size and low cost for real field applications.

We propose in this PhD research project to develop a next generation of LHR (NexLHR) most compact and deployable in order to open an opportunity contributing to the technological transfer for commercialization of this novel instrument. Indeed, the only ground-based network that measures greenhouse gases in the atmospheric column is the TCCON (Total Carbon Column Observing Network) network. However, this network is very dispersed because the cost and the size of the instruments remain important. Only 2 of its 19 sites are in France.

This work will be performed in the framework of the LABEX CaPPA2 project and the CPER INVENT program for research (WP1) and for technology transfer, respectively. This work will be carried out in collaboration with European and American research teams.

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