

Name of research institute or organization:

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**Physikalisch-Meteorologisches Observatorium Davos, World  
Radiation Center**

Title of project:

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Longwave Infrared radiative forcing trend assimilation over Switzerland (LIRAS)

Project leader and team:

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Project description:

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The LIRAS project will investigate downwelling longwave infrared radiation (LIR) measurements during 1994-2009 from four stations in Switzerland, the global GAW station Jungfraujoch, the BSRN station Payerne, the Swiss MetNet station Locarno-Monti and the PMOD/WRC at Davos. The objective will be to produce consistent and quality assessed trend estimates of LIR through the assimilation of this radiation data with a large ancillary data set using the state of the art radiation code and statistical tools (multiple linear regression analysis and singular value decomposition method). Radiative transfer calculations will be used for specific sensitivity studies and for the differentiation between different forcing mechanisms. A major breakthrough in the trend estimation is expected from the use of multiple linear regression analysis and singular value decomposition method, which have never been applied to this dataset before. The application of numerical and statistical models will allow to separate the trends in the observed LIR induced directly by an increase of anthropogenic greenhouse gases (AGHG) and indirectly by the changes of temperature, clouds and water vapor due to changes in the atmospheric state. This approach will be validated by the identical analysis of the LIR trends from the multi-model simulation performed in the framework of IPCC fourth assessment (4AR), when the direct forcing by AGHG is known.

Key words:

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Infrared radiation, Climate change

Collaborating partners/networks:

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