

EGU21-15102

<https://doi.org/10.5194/egusphere-egu21-15102>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



## Observations of internal gravity waves in vicinity of jet streams during SouthTRAC flight on 16 September 2019

**Wolfgang Woiwode**<sup>1</sup>, Andreas Dörnbrack<sup>2</sup>, Felix Friedl-Vallon<sup>1</sup>, Markus Geldenhuys<sup>3</sup>, Andreas Giez<sup>4</sup>, Thomas Gulde<sup>1</sup>, Michael Höpfner<sup>1</sup>, Sören Johansson<sup>1</sup>, Bernd Kaifler<sup>2</sup>, Anne Kleinert<sup>1</sup>, Lukas Krasauskas<sup>3</sup>, Erik Kretschmer<sup>1</sup>, Guido Maucher<sup>1</sup>, Tom Neubert<sup>5</sup>, Hans Nordmeyer<sup>1</sup>, Christof Piesch<sup>1</sup>, Peter Preusse<sup>3</sup>, Markus Rapp<sup>2,6</sup>, Martin Riese<sup>3</sup>, and Jörn Ungermann<sup>3</sup>

<sup>1</sup>Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research, Leopoldshafen, Germany (wolfgang.woiwode@kit.edu)

<sup>2</sup>Deutsches Zentrum für Luft- und Raumfahrt, Institut für Physik der Atmosphäre, Oberpfaffenhofen, Germany

<sup>3</sup>Forschungszentrum Jülich GmbH, IEK-7, Jülich, Germany

<sup>4</sup>Deutsches Zentrum für Luft- und Raumfahrt, Einrichtung Flugexperimente, Oberpfaffenhofen, Germany

<sup>5</sup>Zentralinstitut für Engineering, Elektronik und Analytik-Systeme der Elektronik (ZEA-2), Forschungszentrum Jülich, Jülich, Germany

<sup>6</sup>Meteorologisches Institut München, Ludwig-Maximilians-Universität München, Munich, Germany

The combination of the airborne GLORIA (Gimballed Limb Observer for Radiance Imaging of the Atmosphere) and ALIMA (Airborne Lidar for Middle Atmosphere research) instruments allows for probing of temperature perturbations associated with gravity waves within the range from the troposphere up to the mesosphere. Both instruments were part of the scientific payload of the German HALO (High Altitude and Long Range Research Aircraft) during the SouthTRAC-GW (Southern hemisphere Transport, Dynamics, and Chemistry - Gravity Waves) mission, aiming at probing gravity waves in the hotspot region around South America and the Antarctic peninsula. For the research flight on 16 September 2019, complex temperature perturbations attributed to internal gravity waves were forecasted well above the Atlantic to the south-west of Buenos Aires, Argentina. The forecasted temperature perturbations were located in a region where the polar front jet stream met with the subtropical jet, with the polar night jet above. We present temperature perturbations observed by GLORIA and ALIMA during the discussed flight and compare the data with ECMWF IFS (European Centre for Medium-Range Weather Forecasts – Integrated Forecasting System) high-resolution deterministic forecasts, aiming at validating the IFS data and identifying sources of the observed wave patterns.