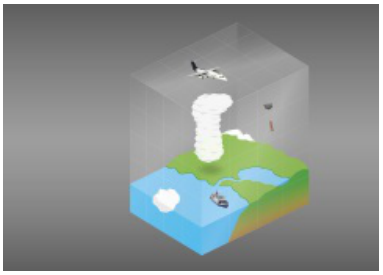

Contribution ID: **22** Type: **Oral presentation**

The Strateole-2 long-duration balloon project in the deep tropics: benefiting from and improving weather forecasts?

Thursday, 13 June 2019 09:50 (20 minutes)

Three long-duration stratospheric balloons were released in February 2010 from Seychelles Island (5°S) by the French space agency (CNES), within the pre-Concordiasi campaign. Once at their float altitude at ∼20 km, these balloons drift on constant-density surfaces, and are simply advected by the wind. The pre-Concordiasi flights lasted for 3 months each. In-situ meteorological measurements (temperature, pressure, and wind deduced from successive balloon positions) were performed every 30 s during the flights, and have revealed large discrepancies between observed winds and those in analyses issued by various operational centers for time periods as long as 1˜month (Podglajen et al., 2014). The errors in modeled winds have been primarily associated with Kelvin and Rossby-gravity wave packets that were not captured in the analyses, despite their planetary-scale structure. The largest errors occurred over the Indian and Eastern Pacific oceans, where in-situ wind observations are very scarce.

These results contributed to the motivation of the forthcoming Strateole-2 balloon campaigns, which will release ∼ 50 similar long-duration balloons in the deep tropics in the 2019-2024 time frame. Strateole-2 balloons will circum-navigate
the Earth around the equator in the lower stratosphere, and provide observations over both continents and oceans. Meteorogical measurements performed during the flights will be sent on the GTS so as to be assimilated by numerical weather
prediction (NWP) systems. The wind observations should particularly contribute to improve NWP wind analyses and forecasts in the tropics. On the other hand, better operational wind products are also very useful for the campaign management. They
for instance provide (i) better guidance on future balloon trajectories, which are monitored for safety reasons, and (ii) opportunities to manage coordinated measurements with instrumented sites at ground.

The presentation will briefly review the past pre-Concordiasi experience, and provide a detailed view of Strateole-2 and its potential interactions with the operational weather forecast community.

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Session Classification: Stratosphere, mountains and wind - Chair: James Doyle

Track Classification: Workshop: Observational campaigns for better weather forecasts