**Fiber-optic Temperature Profiler for Long Duration Balloon Missions**

*“High Resolution Temperature Measurements of the Tropical Tropopause Layer”*

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The Fiber Optic Temperature Profiler is a new instrument currently under development for use on long duration stratospheric balloons. The instrument measures the temperature along a length of optical fiber suspended below a super pressure balloon, providing high temporal and spatial resolution ‘curtains’ of temperature profiles below the balloon. We are currently planning on flying a 2-4km length of fiber (final length dependent on logistical constraints) from the lower of the two Strateole 2 flight levels at 70-75 hPa. In this configuration, we expect to produce temperature profiles spanning the Tropical Tropopause Layer, with a vertical resolution of 2m, a precision of better than 1K and cadence of up to 15 profiles per hour. We currently have an operational prototype instrument that has been successfully flown on short duration sounding balloons. While there is still further development required to produce a long duration instrument, initial results from flights of the prototype instrument suggest a high probability for a successful deployment on the Strateole 2 platform. These high frequency and high-resolution profiles will be of particular value to the study of fine scale atmospheric waves and their phase speed spectrum, the location and evolution of the cold point tropopause, and the characterization of turbulent processes.