THP/SSP measurements of thermal conductivity of Titan's atmosphere

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The THP sensor of the SSP experiment on the Huygens probe has provided more than 200 thermal conductivity data sets during the probe descent in Titan's atmosphere and on the planet surface when it operated for more than one hour after landing. The measurements can be divided into three regimes: (i) during the fast decent after exposing the top hat to the atmospheric flow, (ii) in the lower atmosphere ($<$30 km) where thermal condition in the top hat were stable, and (iii) after landing when the whole top hat was heated from above by the warm elements in the system compartment. Only in the second stage the measurement condition were similar to the ones required in the hot wire method and the determined values of thermal conductivity are close to the expected ones for molecular nitrogen in low temperatures. The data obtained after landing are more difficult to interpret, but nevertheless, one can find that the thermal conductivity increases with temperature at a faster rate than it could be expected for the pure nitrogen atmosphere, hence the methane contribution can be invoked. We will show the obtained results, i.e. thermal conductivity profile, describe the method of data interpretation and discuss the possible improvements of the model describing the measurement process.