



ZyTemp TN9: A cost effective longwave radiometer

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The ZyTemp TN9 is a thermal infrared (TIR) sensor that is mass-produced for usage in handheld non-contact thermometers. The TN9 measurement principle is very similar to that of very costly meteorological pyrgeometers. An interesting advantage is that the costs of the TN9 are about Eu 5. The TN9 provides observed thermal radiation, the temperature of the measurement instrument, and the emissivity used. The output is provided through a somewhat special Serial Peripheral Interface protocol. By combining the TN9 with an Arduino board we were able to read out the TN9 and to register the data on a USB memory stick. A solar cell, lead acid battery, housing and stand completed the measurement set up. Total costs per set were in the order of CHF 200. Land surface atmosphere interactions in the Swiss Alps are spatially heterogeneous. Shading, multi-layer cloud formation, and up- and downdrafts make for a very dynamic exchange of mass and energy along and across slopes. In order to better understand these exchanges, the Swiss Slope Experiment at La Fouly (SELF) has built a distributed sensing network consisting of eight micro-met stations and two flux towers in the "La Fouly" watershed in the upper Alps. To obtain a better handle on surface temperature, fifteen TIR sensing stations were installed that made observations during the 2010 Summer. Not all installations were fully successful but it was possible to obtain interesting distributed results across the slope. At the poster presentation, a live demonstration of the ZyTemp TN9 measurement device will be given.