Geophysical Research Abstracts, Vol. 9, 10058, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-10058

A method to overcome the problem of 'slow' sensors

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In general sensors have a certain inertia. I.e. they follow a sudden change of the quantity they measure with a certain delay. As a result they give a signal which is smoothed in time. The sensor is slow in the sense that its response time is larger than the shortest time scale we want to resolve. In many cases it is desirable to have a faster response of the sensor. Since the higher frequency parts of the signal are damped but not erased it is possible to reconstruct the original signal.

We present a method based on digital filters. This method can be applied in realtime to the incoming dataflow. It is possible to adapt the filter to the characteristics of the sensor and the noise in the signal. Possible applications are REA systems, radiosoudings etc. As an example the method is applied to temperature and humidity profiles measured within the Banner cloud project at the cable cars at mount Zugspitze Germany.