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Wind information derived from hot air balloon flights for use in short term wind forecasts: quality and first impact results

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With increasing model resolutions more detailed observations are necessary. High resolution upper air wind observations are sparse and third party observations are a welcome additional source of meteorological information. In this paper we show the possibility of applying balloon flights as an upper air wind measurement. The displacement of a hot air balloon is a direct measure for the wind speed and direction and thus a potential source for wind observations in the lower part of the troposphere. This part of the atmosphere is not frequently sampled, apart from radiosonde launches and airports. These hot air balloons tracks can produce useful wind observations just above and in the atmospheric boundary layer. We compare observed and predicted balloon trajectories and show the impact of the assimilation of balloon derived wind information. First attempts are made of the assessment of the quality of this new observation type. There is a clear potential for operational use, because these balloons are allowed to carry a transponder with which the position can be tracked by for example an Air Traffic Control agency.