17VS053 Cloud Nowcasting: Motion Analysis of All-sky images using velocity Fields

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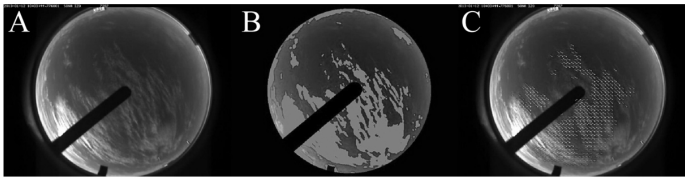
Cloud monitoring and prediction is crucial to air traffic and weather forecast. Clouds play a key role in solar radiation balance. These issues have prompted Sieltec Canarias S.L. and AEMET to develop an automatic system of cloud observation (SONA). This system provides cloud cover percentage using all-sky images and data from a multichannel photometer, which are processed by neural networks. Once the system has detected and recorded cloud images, a cloud motion technique makes possible to obtain several "velocity fields", corresponding to different layers of clouds. The evolution in time of these velocity fields is a powerful tool to provide very short term forecasting (less than 1 hour) of cloudiness (known as cloud nowcasting). In the future, this information, combined with Radiative Transfer Models, may be used to predict solar radiation (Global Horizontal Irradiance –GHI- and Direct Normal Irradiance –DNI-)



(A) Original image. (B) Image analysed by the neural network with cloud pixels marked as green. (C) Image with two clustered velocity fields marked as green and yellow, respectively.

17VS058 Time-Synchronous Sampling in Wireless Sensor Networks

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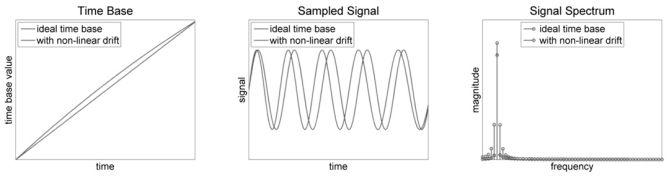
A large variety of time synchronization protocols for wireless sensor networks has been suggested. Yet, setting up a sensor network for synchronized data acquisition based on those algorithms is not a trivial task. This paper outlines different approaches to time synchronous sampling in wireless sensor networks, discusses their advantages and disadvantages and gives recommendations on when to chose which approach.

Keywords: wireless sensor network, time synchronization, sampling



Effects of non-linear drift in the time base on the acquired signal