Water vapor estimation via propagation delay of 920MHz wireless communication signal

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We have developed a 920MHz wireless communication module that can measure the variation of propagation delay precisely (6mm precision) and frequently (20 times/second). We have monitored the variation of propagation delay between 2 places that are 4.25km apart with line-of-sight. The result agreed well with the estimated propagation delay using the data obtained by meteorological observation equipment. This technique is suited to monitor the distribution of surface water vapor, compared to GNSS that primarily measures the propagation delay in vertical direction.
We are seeking the right path for social impremention of this technology, aiming to provide a mean to measure the surface water vapor with high precision, high frequency and high resolution in a cost-effective way.

Keywords: water vapor estimation, space-time synchronization, propagation delay measurement, wireless communication module