# Abstracts

## Novel methods of measuring impurity levels in liquid tanks

*M. Weiss and R. Knochel. "Novel methods of measuring impurity levels in liquid tanks." 1997 MTT-S International Microwave Symposium Digest 3. (1997 Vol. III [MWSYM]): 1651-1654.*

A microwave multi level gauging system employing a FSCW radar measurement technique is described. Conventional FMCW radar technique is normally employed to find only the level of the liquid surface in storage tanks. The system described here also detects a second level, caused for example by an impurity such as water in a petrol tank. For estimating the time delay and amplitude of each reflection from each scatterer an optimal signal processing algorithm is derived, based on a reference model. To determine the physical height of the impurity level, in for example petrol tanks, the dielectric constant of the petrol must be known. A novel algorithm is derived for estimating this from the same measurement. Measurement uncertainties of /spl plusmn/0.2 mm have been achieved for the multi level range detection, performed in the frequency range from 1.5 to 3.5 GHz. From this measured data the error of the calculated dielectric constants was about to 1%. This yields an accuracy for the petrol height of 0.5%.

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