

# **Fully-Differential Capacitive Sensors for Seismometers**

(Poster presentation)

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## ABSTRACT

Although sensors used in the majority of high-performance seismometers are capacitive, the performance of present commercial instruments is less than what it could be--due to the choice of less-than-optimal electrode configurations. The detector in commercial instruments has only one-half the symmetry of the patented symmetric differential capacitive (SDC) transducer, also known as 'fully differential' -- or 'doubly differential', in the words of the legendary R. V. Jones. Reduced symmetry is responsible for a two-fold reduction in idealized sensitivity (calculations based on constant electrode total area). The actual performance of such a sensor is even worse than 50% of a comparable SDC device, due to additionally reduced common mode rejection and linearity. The superior performance of fully differential detectors has been demonstrated in theory and also in practice, as they are becoming the sensor of choice for MEMS devices such as accelerometers.