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## Watt's linkage based large band low frequency sensors for scientific applications

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The UNISA Folded Pendulum is a very effective mechanical system for the implementation of uniaxial (horizontal and/or vertical) and triaxial seismometers and accelerometers for ground, space and underwater applications, including ultra-high vacuum and cryogenics ones.

The UNISA Folded Pendulum innovative architecture, based on the classic Watt-linkage mechanical configuration, allows the design and implementation of very large band sensors (10–7 Hz –100 Hz), characterized by very high quality factors ( $Q > 2500$  in air,  $Q > 15000$  in medium vacuum) and sensitivities that, for the most common applications, do not depend on the mechanics, but only on the readout techniques ( $< 10\text{-}12$  m/sqrt(Hz) with classic LVDT readout). These already unique features are coupled with other very relevant characteristics, like full scalability, high compactness ( $< 10$  cm), lightness ( $< 300$  g), high directivity ( $> 10000$ ), tuneability (typical mechanical resonance frequencies are in the band 100 mHz –100 Hz), very high immunity to environmental noises.

In this paper we present some UNISA Folded Pendulum based uniaxial and triaxial seismometers and accelerometers, discussing relevant results of laboratory tests and of field applications.

Keywords: Seismometer, Accelerometer, Folded Pendulum, Monolithic Sensor.

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