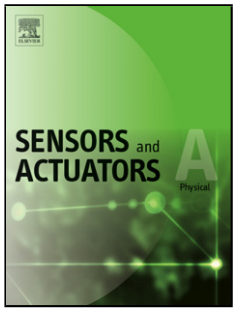

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An improved sensor for the magnetic susceptibility imaging technique for detecting impurities in non-ferromagnetic materials

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Graphical Abstract:

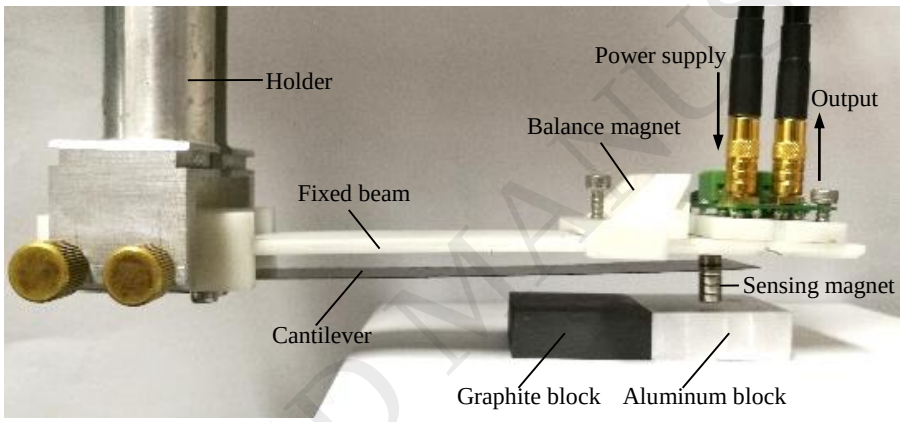

Photo of the cantilever-based sensor

Highlights:

- Magnetic susceptibility imaging is realized using a cantilever-based sensor
- The cantilever-based sensor is improved to have higher lateral resolution
- Para- and ferromagnetic impurities are successfully detected from resin block

Abstract: A cantilever-based sensor of magnetic force is a potential tool for magnetic susceptibility imaging in bulky materials. To solve the limitations of the previously reported sensors, in this study, a Hall device is employed to measure the magnetic field variation caused by the displacement of sensing magnet attached to the free end of the cantilever. The improved sensor has the smaller size and the higher lateral resolution and the adopted permanent magnet can be attached onto the cantilever's free end to improve its sensitivity to the magnetic susceptibility. Based on the improved sensor configuration, two