

## A metal-based Hall sensor material is coming!!

Cheap ingredients and low- $T$  fabrication compatible with mass production  
Hall sensor operable under bending conditions and over a wide  $T$  range

### Introduction

Conventional Hall sensors (a type of magnetic-field sensors) rely on highly crystalline semiconductors such as GaAs and InSb that show the large ordinary Hall effect. However, the requirements for low carrier density and high mobility impose strong constraints on the fabrication processes and conditions. Also, their strong  $T$ -dependent electrical properties must be cancelled out with additional ICs to achieve Hall sensor operation over a wide practical  $T$  range.

This invention describes a ferromagnetic Fe-Sn alloy, which can work as a superior Hall sensor material owing to the large anomalous Hall effect. This novel material offers many technological advantages including cheap and non-toxic ingredients, the room-temperature growth on various substrates, and high sensitivity and thermal stability.

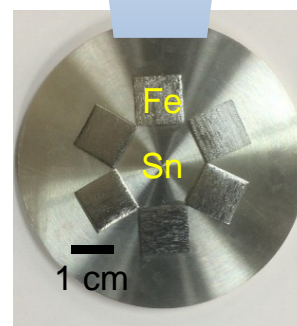
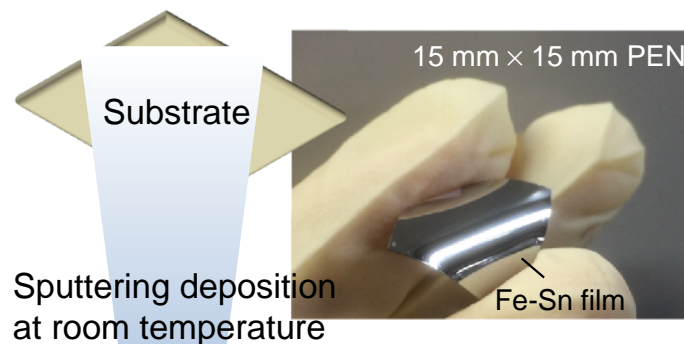
### Effect & Application

- Film growth on commercial flexible substrates
- Sensitivity comparable to those of conventional semiconductor Hall sensors
- Superior temperature stability without IC correction

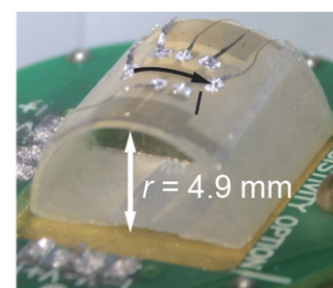
### Patent Data Sheet

Application No.(Serial No.): PCT/JP2019/032898 (T18-016)  
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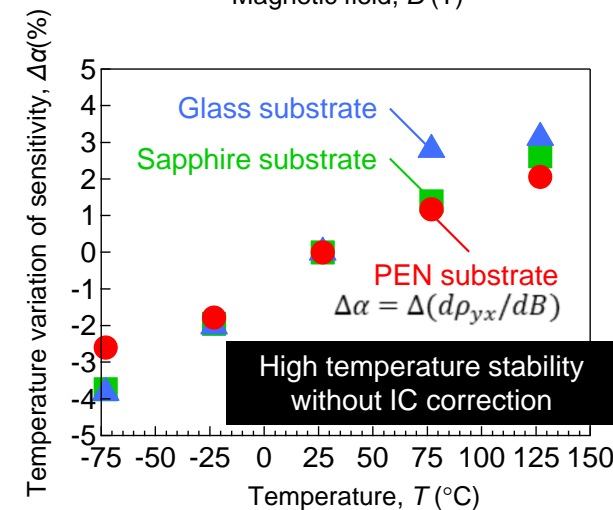
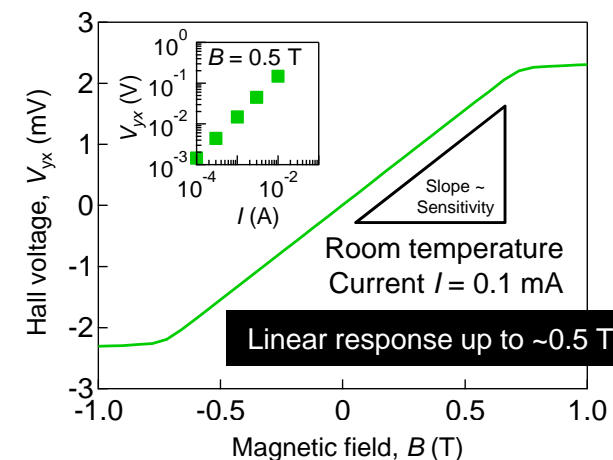
#### Large-area uniform film formation



Cheap and non-toxic ingredients



The "flexible Hall sensor" operation has been demonstrated.



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