A Novel Co-casting Process for Multilayer Ceramics

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Motivation

- Development of a lab-scale process for low-volume production of multilayer ceramics (MCs)
- Maximising layer thicknesses < 100 μm in co-fired MCs
- Reducing the inductance of the single-layer structure (GDE)
- Reduction of coating thickness in co-firing
- Development of a PZT-based low-frequency co-firing composition
- Reducing the silver thickness in piezoelectric vibration energy harvesters (PZT)

Target

- Co-casting process
- Compatibility of co-casting layers
- Electrodes for co-casting

From powder to component

- Formulation for the PZT rubber and the Ag-casting mixture developed
- New co-casting process to achieve an undamaged and conductive drying and sintering reproducibility of both materials

Co-casting

- The advantage of co-casting is that the entire multilayer manufacturing process can be performed simply by depositing a suspension or a small tape casting machine and sintering to form a dense body
- The body must be dense enough to withstand thicknesses below 100 μm and be fired at the green state of the MCs (20 μm in the co-fired state)

Testing

Co-firing was performed successfully at 900 °C. Lateral Anisotropies below 20 μm could be realized in the co-cast MCs after sintering.