A 2D axisymmetric finite-element model implementing the H-formulation was used to investigate the magnetisation properties of iron-pnictide (Ba122) bulk superconductors.

The experimentally measured trapped fields are reproduced well for a single bulk, as well as a stack of bulks, using the measured $J_c(B, T)$ characteristics of a small sample.

With current state-of-the-art superconducting properties, surface trapped fields $> 2$ T could readily be achieved at 5 K (and $> 1$ T at 20 K) with a sample diameter of 50 mm.

An aspect ratio between 1-1.5 (radius : thickness) would be an appropriate compromise between the accessible surface trapped field and volume of superconducting materials.

Access the manuscript here.