

## **Improving the synthesis and properties of SBT thin films by using SBT seeds**

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### **Abstract**

Among the different materials mostly used for ferroelectric applications,  $\text{SrBi}_2\text{Ta}_2\text{O}_9$  (SBT) and  $\text{SrBi}_2\text{Nb}_2\text{O}_9$  (SBN) are gaining our increasing interest for the production of Non-Volatile Random Access Memories (NVFRAMs) due to their fatigue endurance properties. However, the high temperatures needed to obtain these compounds in a straightforward way, makes necessary to search alternative procedures to synthesize them. In this work the use of SBT seeds to improve the synthesis of SBT thin films by a sol-gel procedure is investigated and their effects on the thin film properties are evaluated. XRD analysis of the obtained seeded and unseeded thin films, annealed at different temperatures, shows that the use of SBT seeds lowers the crystallization temperature of the perovskite phase. SEM analysis of the thin film microstructure reveals that more elongated grain develop when seeds are used. Ferroelectric properties are also affected by the seeding procedure, namely the Remanent Polarization ( $P_r$ ) that increases. The electrical and ferroelectric characteristics of both types of films, seeded and unseeded, are comparatively discussed and correlated to the different synthesis conditions of the films.

