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## Ferroelectric memory resistive behavior in BaTiO<sub>3</sub>/Nb doped SrTiO<sub>3</sub> heterojunctions

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### Abstract

We present the memristive (memory resistive) behavior in two different pulsed laser deposited BaTiO<sub>3</sub>/Nb doped SrTiO<sub>3</sub> junctions. The first junction is controlled by space charge limited current (SCLC) conduction while the post-annealed junction is dominated by Schottky emission. The latter junction displays better ferroelectric and memristive properties (with an order of magnitude higher OFF/ON resistance ratio) as compared to the former junction with SCLC conduction. We attribute the improved behavior of the latter junction to the reduction of oxygen vacancies due to post-annealing of the film.

**Keywords:** Barium titanate, Memory resistor, Schottky emission, Space charge limited conduction, Pulsed laser deposition.

### 1. Introduction:

In recent years, continuously tunable resistive state device, popularly known as memristor (memory resistor), has attracted tremendous attention due to lower power operation, and ultra-high density memory [1-10]. While the memristor was first suggested by Leon Chua in 1971 [11], the first practical memristor based on TiO<sub>2</sub> film was fabricated by Strukov *et al.* [12]. Since then, several authors reported such behavior in variety of materials such as organic films

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