

Abstract Submitted  
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**Tailoring size and density of Au clusters grown by sputtering** NATHALIE LIDGI, P. SENEOR, J. CARREY, F. NGUYEN VAN DAU, A. FRIEDERICH, A. FERT, C. DERANLOT, A. VAURES — We have investigated the growth of Au clusters on amorphous Al<sub>2</sub>O<sub>3</sub>. On such a surface the growth mode is governed by nucleation on defects. It has been shown [1] that during the growth, the larger clusters can trap off from a defect and diffuse on the surface. This mechanism promotes the clusters enlargement at the first stage of growth. In order to control the distribution of defects and thus, the cluster size, we have etched the alumina surface with Ar<sup>+</sup> plasma. Finding the good parameters allows to control the cluster size distribution and the cluster density. Thanks to this technique, we have reduced the dispersity of the cluster size distribution by 50%. In a second part, this assembly has been integrated in a tunnel junction. The sample exhibits Coulomb blockade behavior at near room temperature. We will discuss the growth mechanisms that lead to a control of the dispersity and we will show how these nanostructures can be used as a novel concept of variable capacitor [2]. [1] J. Carrey et al., PRL 86, 4600 (2001) [2] P. Seneor et al., EPL 65, 699 (2004)

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