1. Record Nr. UNINA9910795452803321

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Titolo	Electrical characterisation of ferroelectric field effect transistors based on ferroelectric HfO2 thin films / / Ekaterina Yurchuk
Pubbl/distr/stampa	Berlin : , : Logos Verlag, , [2015]
ISBN	3-8325-9478-7
Descrizione fisica	1 online resource (x, 170 pages)
Collana	Research at NaMLab
Disciplina	661.0514
Soggetti	Hafnium Ferroelectric crystals
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	PublicationDate: 20150630
Sommario/riassunto	Long description: Ferroelectric field effect transistor (FeFET) memories based on a new type of ferroelectric material (silicon doped hafnium oxide) were studied within the scope of the present work. Utilisation of silicon doped hafnium oxide (Si:HfO raisebox-0.5ex scriptsize 2) thin films instead of conventional perovskite ferroelectrics as a functional layer in FeFETs provides compatibility to the CMOS process as well as improved device scalability. The influence of different process parameters on the properties of Si:HfO raisebox-0.5ex scriptsize 2 thin films was analysed in order to gain better insight into the occurrence of ferroelectricity in this system. A subsequent examination of the potential of this material as well as its possible limitations with the respect to the application in non-volatile memories followed. The Si: HfO raisebox-0.5ex scriptsize 2-based ferroelectric transistors that were fully integrated into the state-of-the-art high-k metal gate CMOS technology were studied in this work for the first time. The memory performance of these devices scaled down to 28 nm gate length was investigated. Special attention was paid to the charge trapping phenomenon shown to significantly affect the device behaviour.