

방사광의 나노과학 응용

Synchrotron Radiation for Nano Science

백성기

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최근에 나노과학기술에 대한 관심이 고조 되면서 방사광에 대한 관심도 커지고 있다 방사광은 적외선으로 부터 가시광선, 자외선, X-선에 이르는 넓은 파장영역에서 높은 휘도, 방향성, 편광성을 동시에 갖고 있어 그 응용성이 뛰어나다 특히 최근에는 방사광을 수십 나노미터수준까지 집속시킬 수 있는 X-선광학기술의 획기적 발전에 힘입어 나노공정 및 나노분석 기구로써 크게 주목을 받고있다 본 발표에서는 포항방사광원(Pohang Light Source)의 전반적인 현황과 함께 주요 나노공정 및 분석 관련 빔라인의 광학적 특성과 분석 능력, 아울러 이를 이용한 주요 연구 사례를 소개한다

Computer Simulation of P-E Curves of Non-linear Dielectrics and Application to SPICE

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Recently, nonlinear dielectrics such as ferroelectrics, relaxors and tunable capacitors are desired to be handled in circuit simulators In this presentation, we are going to propose a bridge from material science to the circuit design through a computer simulation technique of P-E curves and the SPICE circuit simulator In the simulation of P-E curves, a P-E curve was divided into two parts, nonlinear dielectricity and pure ferroelectricity The non-linear dielectricity was represented by an expansion in terms of electric field, whereas the ferroelectricity was simulated by assuming the distribution of domain-switching possibility by electric field Two Gaussian distribution functions were required to accurately simulate a wide variety of ferroelectrics The simulation technique was adaptable from tunable capacitor materials to normal ferroelectrics Software was developed to generate "netlist" data for the SPICE circuit simulator