

## Low Temperature Direct Wafer Bonding: Mechanisms and Applications

# Dr. Hubert Moriceau

CEA-Leti, MINATEC Campus,  
Silicon Technologies Division

日時: 2012年5月21日(月) 13:30-15:30

会場: 東京大学農学部フードサイエンス棟  
中島董一郎記念ホール

### 要旨

Direct wafer bonding processes are more and more attractive to achieve stacking structures. Some processes have been already implemented in industrial applications for several years. The most well known application is the mass production of silicon on insulator (SOI) bonded structures performed thanks to the Smart Cut™ technology. Recent advances have led to the emergence and development of direct-bonded structures suitable for an attractive field of innovative applications. In a generic approach, direct wafer bonding consists in contacting two wafer surfaces without any additional adhesive in between. Considering contacts by adhesive asperities at a micrometer or nanometer scale have led to the emergence of bonding models associated to statistical descriptions of surfaces. Si or SiO<sub>2</sub> direct bonding have been widely studied for more than 20 years and widely applied in the SOI wafer fabrication. When performed with other materials, either surface preparations have to be tuned or surfaces can be capped by bonding layers. Nowadays, many hetero-structures are successfully obtained by direct wafer bonding, in which at least one wafer can be thinned down to a few micrometers depending on applications. An overview on mechanisms and results of direct bonding will be mainly focused on Si or SiO<sub>2</sub> bonding processes. Recent developments will be presented for achievements of innovative bonded structures suitable for new applications in microelectronics, micro-technologies, sensors, MEMS, optical devices, biotechnologies, 3D-integration....



主催: 東京大学グローバルCOEプログラム「機械システム・イノベーション国際拠点」  
本件連絡先: 東京大学大学院工学系研究科 精密機械工学専攻 教授 須賀 唯知  
E-mail: [suga@pe.t.u-tokyo.ac.jp](mailto:suga@pe.t.u-tokyo.ac.jp) Phone: 03-5841-6491  
GCOE事務局 E-mail: [gmsi-office@mechasys.jp](mailto:gmsi-office@mechasys.jp) Phone: 03-5841-7437