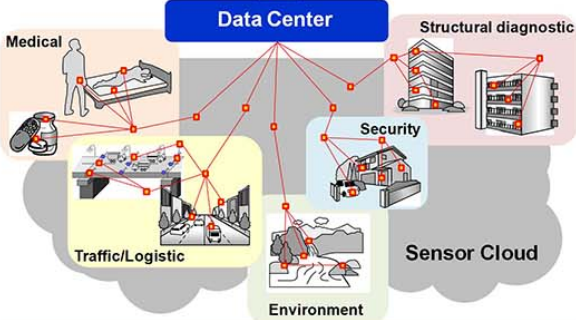




Activity on Prof. Kuwano's Working Group

1. Introduction Sensor Communication Society

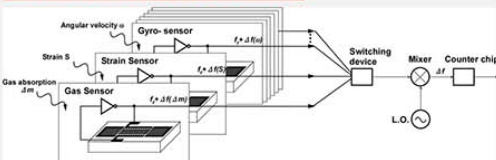
New applications, New data services, and New infrastructures



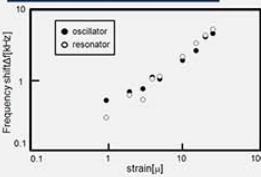
- Big data as an informative infrastructure
⇒ Security app., disaster alert, etc..
- Big data for open source ⇒ New business creation
- Wide-dispersed system of wireless sensor nodes
<Key technologies>
 - Sensors for wireless systems
 - Micro energy sources
 - New fabrication technologies

2. Sensors for wireless systems

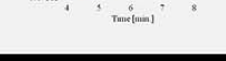
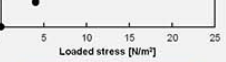
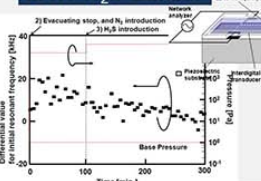
SAW multi-sensors module



SAW Strain Sensor



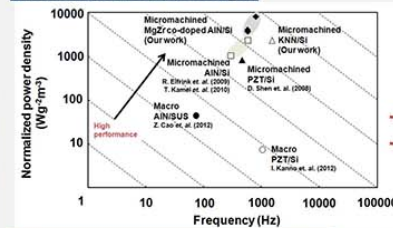
SAW H₂S Sensor



3. Micro Energy Sources

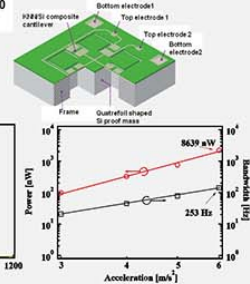
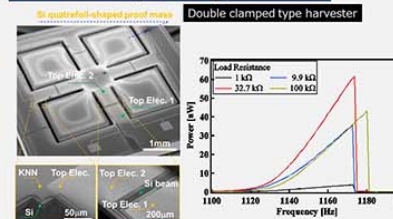
Piezoelectric type harvester

Material breakthrough



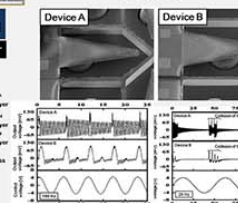
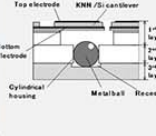
- Pb free (K,Na)NbO₃
- Pb free Zn,Mg co-doped AlN

Wide band power generation



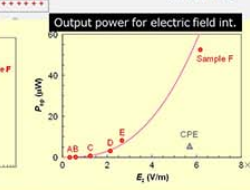
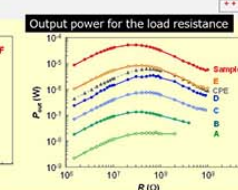
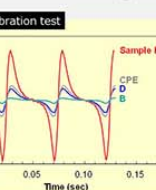
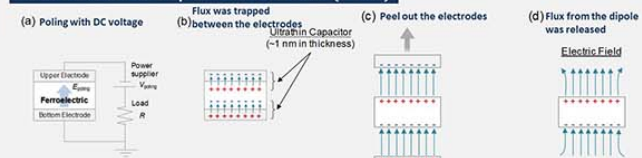
DC operation

Ball impact type harvester



Electret type harvester

Ferroelectric Dipole Electrets (FDE)



4. New fabrication technologies

Nanoparticle synthesis

Micro FIB system

