Complex Network Analysis for Organizational Management

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A program "Saltie" which analyzes network-structure was developed. By using "Saltie", I analyzed and visualized a network structure of researchers in AIST and their co-authors (as shown in Figs.1 and 2). The value of short path betweeness (SPB) was analyzed and 10 linkages with large SPB are visualized.

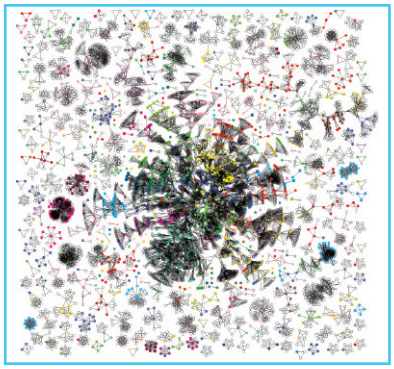

Fig 1: An example of Coauthor Networks. Network is constructed from the oral presentations in 2004. Each node color represents the researher's divison: 1) Violet is Life Science & Technology, 2)Bule is Information Technology, 3) Yellow is Nanotechnology , Materials & Manufacturing, 4) Green is Environment & Energy, 5) Aquamarine is Geological Survey and Applied Geoscience, and 6) Red is Metrology and Measurement Technology.

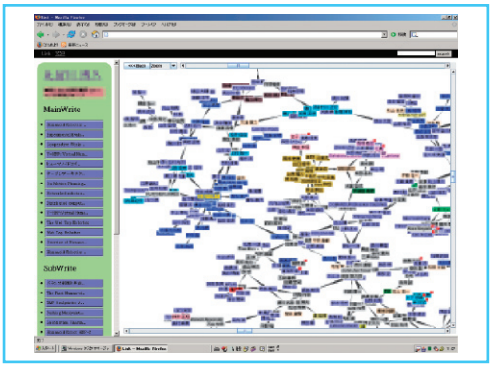

Fig 2: An example of Coauthor Map on Saltie Web.

Development of acoustic emission method for monitoring superconducting devices.

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Superconducting devices have been playing very important roles in various area of our life, e.g., energy technology, medical science and physics. Performance of the devices is restricted by temperature, current, magnetic field and electromagnetic forces, etc. In order to improve superconducting devices, various development is necessary for those factors. Acoustic emission (AE) method has unique advantages, i.e., it can monitor global information of superconducting devices without disturbing their electrical insulation, contributing to development of superconducting devices. We have been developing the AE methods for the application to alternating current superconducting coils which require higher performance than that of direct current superconducting coils. A large-scale superconducting coils including Central Solenoid model coil developed in International Thermonuclear Experimental Reactor program were also monitored by the AE methods, and new results have been obtained.

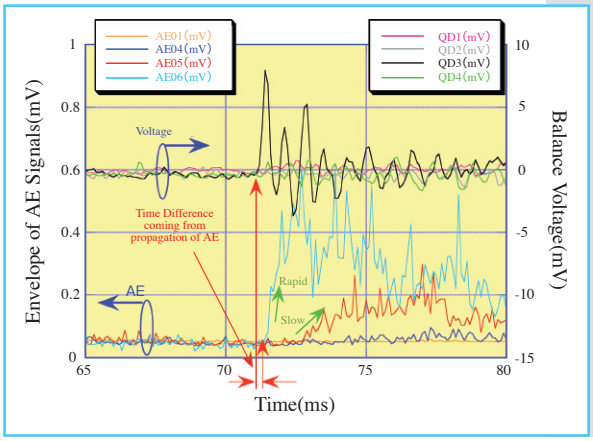

Figure: Time dependence of AE signals and balance voltages. The AE signals and voltage pulses were synchronized during operation of International Thermonuclear Experimental Reactor (ITER) Central Solenoid model coil, corresponding to disturbance in the coil. Balance voltage indicates imbalance of voltage in the coil. Relation between the voltages and AE signals provide us with information to determine the locations where disturbances took place in the coil.