Activity report for period from Oct. 1, 2003 to Mar. 30, 2004

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Academic activities:

Research on repairing or strengthening technology for existing deteriorated concrete structures by using new materials is very important for the purpose of building up a reasonable maintenance solution for our infrastructure system. Using Fiber Reinforce Polymer (FRP) materials is one of the most popular repairing or strengthening methods at present. In the past half a year, the main research topic of mine is "*Fracture mechanics of the interface between externally bonded FRP sheets and concrete*". The purpose of this study is to clarify the interface bond force transfer mechanisms for FRP externally repaired or strengthened concrete structures and to build up corresponding analytical models. Related to this research topic, I finished the experimental phase work and did several parts of analytical work. The research achievements have been summarized in the following three papers:

1. Jianguo Dai, Tamon Ueda and Yasuhiko Sato, 2004. Development of Nonlinear Bond Stress-Slip Model of FRP sheet-concrete Interfaces with a Simple Method. *American Society of Civil Engineering, Journal of Composites for Constructions,* (accepted for publication)
2. Jianguo DAI, Tamon UEDA and Yasuhiko SATO, 2004, Dowel Effects on Interface Shear Bond Force Transfer in FRP sheet Flexurally Strengthened Concrete Beams, *Proceedings of Japan Concrete Institute (JCI),* Vol.26, (accepted for publication)
3. Jianguo Dai, Tamon Ueda, Yasuhiko Sato & Hadiyono Jaqin, 2004, Dowel Resistances of Bond Interfaces between FRP sheets and Concrete, *the Second International Conference on FRP in Civil Engineering*, Australia, (submitted)

Social activities;

- A member of organizing committee of "Workshop on Microstructure and Durability to predict Service Life of Concrete Structure ", Sapporo
- A member of organizing committee of " Annual Conference of International Committee for Concrete Mode in Asia (ICCMC)", Sapporo

Research topic for fiscal year April 1 2004 to March 31 2005:

In coming fiscal year, the main topic of my research will be *"Failure simulation and optimal interface design of FRP sheets externally strengthened reinforce concrete members*". Trough this study, it is expected to make clear the failure process of reinforced concrete members externally bonded FRP. In addition, it is expected to find optimum interface design criteria for strengthening deteriorated RC members more efficiently in different cases.