

Research and Application of Mobile Communication Network Theory and Technology for High-Speed Railway in Indonesia

Principle Investigator :

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2. Institut Teknologi Bandung: Prof. Yul Y. Nazaruddin.

The research tasks from both sides regarding this project are as follows:

Beijing Jiaotong University: 1) according to Indonesian wireless communication service requirement and spectrum regulation, research multinational GSM-R and LTE-R spectrum and bandwidth requirement; 2) develop Jakarta-Bandung High Speed Rail channel model; 3) research reliable transmission techniques for 350 km/h Jakarta-Bandung High Speed Rail; 4) research multi-interface data-stream real-time tracking techniques, network interface monitoring techniques, network infrastructure monitoring techniques for GSM-R and LTE-R; research interface monitoring data-based network performance analysis method and prewarning techniques, and develop the prototypes; 5) research network compatibility techniques for GSM-R and LTE-R for Jakarta-Bandung High Speed Rail; 6) research 5G-R and IoT theory and techniques for Jakarta-Bandung High Speed Rail service and application requirements; 7) develop experimental simulation platform for propagation and channel modeling, reliable key techniques, 5G-R and railway IoT key techniques for Jakarta-Bandung High Speed Rail.

Assessment criteria for BJTU: 6 top SCI journal papers; Application of 2 patents; Proposal of 1 industrial standard; 2 research reports (report 1: band requirements and business model for cross county high speed railway mobile communication systems; Report 2: Reliable transmission key technology for Jakarta-Bandung High Speed Rail.); Education of no less than 5 high-end academic staff; Training no less than 5 PhD students.

Institute Technology Bandung: 1) channel measurement and channel modeling at the relevant spectrum in Indonesian terrain; 2) GSM-R and LTE-R radio resource management technology for Jakarta-Bandung High Speed Rail; 3) NOMA, massive MIMO and beamforming techniques for 5G-R; 4) Performance simulation platform of key technologies; 5) Support the prototype equipment of GSM-R and LTE-R from Chinese side to have a real test in Jakarta-Bandung High Speed Rail line.

Assessment criteria for Institute Technology Bandung: 1 top SCI journal papers jointly with BJTU; 1 application invention patent; Support the prototype equipment of GSM-R and LTE-R from Chinese side to have a real test in Jakarta-Bandung High Speed Rail line.

Intellectual property agreement:

Cooperation between the two sides has no intellectual property dispute. The joint-development achievements have common property. If the achievements are developed unilaterally, the intellectual property rights belong to the side that developed the achievements.