

From: Thomas Choi

To: Doug Young

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Subject: Request for Info - File # 0100-EX-PN-2017

Message:

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Exhibit Documenting Eligibility for a Program Experimental License in Accordance with 47C.F.R.§5.302.

This experimental license application is for requesting eligibility to conduct distributed MIMO research at University of Southern California – main campus with 3.3 to 3.7 GHz frequency and transmit power less than 10 Watts.

The distributed MIMO experiments will be conducted by members of University of Southern California – Wireless Devices and Systems Group (USC-WiDeS) led by Professor Andreas Molisch. University of Southern California is an academic institution accredited by the Accreditation Board for Engineering and Technology. USC Electrical Engineering department, which will oversee this experiment, has been accredited since 1942 to present, with next review year scheduled in 2021-2022. This may be verified on ABET Website:

<http://main.abet.org/aps/AccreditedProgramsDetails.aspx?OrganizationID=107&ProgramIDs=>

USC-WiDeS group has been actively pursuing research in wireless channel measurements and modeling. Professor Andreas Molisch is the Principal Investigator, and two PhD students, Celalettin Umit Bas and Thomas Choi, will conduct experiments under his guidance. Professor Andreas Molisch and USC-WiDeS group's expertise on radiofrequency experimentation and ability to manage wide variety of research projects are shown through published papers from earlier experiments [1]-[5].

This experiment will require frequency between 3.3 GHz to 3.7 GHz for research reasons (high resolution time domain data coming from wide bandwidth of 400 MHz), as well as hardware requirements. The experiments will be conducted responsibly within University of Southern California's main campus, located on (153.061886, -26.718614), with campus size of 1.24643 km².

References:

[1] R. Wang, O. Renaudin, C. U. Bas, S. Sangodoyin and A. F. Molisch, "High-Resolution Parameter Estimation for Time-Varying Double Directional V2V Channel," in IEEE Transactions on Wireless Communications, vol. 16, no. 11, pp. 7264-7275, Nov. 2017.

[2] R. Wang, C. U. Bas, O. Renaudin, S. Sangodoyin, U. T. Virk and A. F. Molisch, "A real-time MIMO channel sounder for vehicle-to-vehicle propagation channel at 5.9 GHz," 2017 IEEE International Conference on Communications (ICC), Paris, 2017, pp. 1-6.

[3] C. U. Bas and S. C. Ergen, "Ultra-wideband Channel Model for Intra-vehicular Wireless Sensor Networks Beneath the Chassis: From Statistical Model to Simulations," in IEEE Transactions on Vehicular Technology, vol. 62, no. 1, pp. 14-25, Jan. 2013.

[4] D. Cassioli, M. Z. Win and A. F. Molisch, "The ultra-wide bandwidth indoor channel: from statistical model to simulations," in IEEE Journal on Selected Areas in Communications, vol. 20, no. 6, pp. 1247-1257, Aug 2002.

[5] A. F. Molisch, J. R. Foerster and M. Pendergrass, "Channel models for ultrawideband personal area networks," in *IEEE Wireless Communications*, vol. 10, no. 6, pp. 14-21, Dec. 2003.