

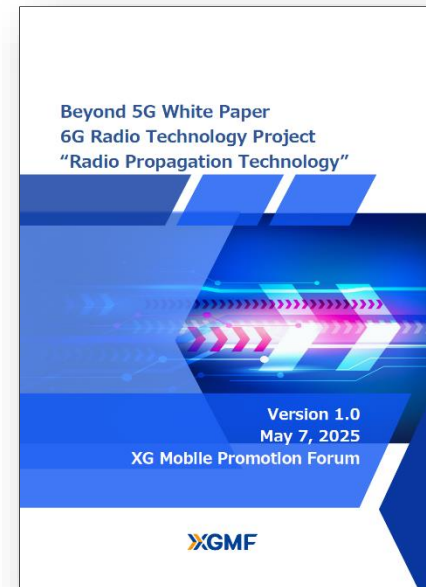
Abstract of Beyond 5G White Paper 6G Radio Technology Project “Radio Propagation Technology” (Short ver.)

September 30, 2025

Contents of radio propagation white paper

- The World's First White Paper Focused on Single 6G Propagation Technology
- Announced on May 7, 2025, confirmed by all radio propagation WG members

Contents			Author
Overall Coordinator			Mr. Ito (KDDI research) Mr. Kuno (NTT docomo)
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		1.1.2 ITU-R	NTT • SoftBank
	1.2 Recent Academic Activities	1.2.1 Channel model	Niigata Univ.
		1.2.2 ISAC	NTT
		1.2.3 RIS	KDDI research
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1. Trends of Radio Propagation towards Beyond 5G/6G

- World trends in standardization and academic societies and trends in Japan are introduced.

Category	Topic	Author
I-1. Recent Standardization Activities	I-1.1. 3GPP Release 19 I-1.1.1. 7 to 24 GHz Band Channel Modelling I-1.1.2. ISAC Channel Modelling	SHARP Mr. Fukui, Ms. Hirata, Dr. Yokomakura NTT docomo Mr. Kuno, Dr. Suyama
	I-1.2. ITU-R I-1.2.1. NTN I-1.2.2. ITU-R SG3 and SG5 WP5D	SoftBank Dr. Omote NTT Dr. Yamada
I-2. Recent Academic Activities	I-2.1. MmWave and Sub-THz Channel Modeling	Niigata Univ. Prof. Kim
	I-2.2. Radio Propagation for ISAC	NTT Dr. Yamada
	I-2.3. RIS-Based Propagation Modeling	KDDI research Mr. Matsuno
	I-2.4. Radio Propagation for HAPS / NTN	SoftBank Dr. Omote
	I-2.5. Radio Propagation Emulation for Digital Twin	KDDI research Mr. Nagao
	I-2.6. Radio Propagation Simulation for CPS	NTT docomo Mr. Kuno, Dr. Suyama

2. Recent Activities of Radio Propagation in Japan

- Propagation research results related to 6G carried out so far in Japan are introduced.

Category	Topic	Author
II-1. Measurement	II-1-1. Indoor Propagation Channel Measurements in 160 GHz	NTT docomo
	II-1-2. 300GHz Band Propagation Loss in the vicinity of the human body	KDDI research
	II-1-3. 300GHz Band Propagation Characteristics in the Indoor and Outdoor Environment	KDDI research
	II-1-4. Path Loss Characteristics from Microwave to Sub-Terahertz Bands in Urban Environment for Beyond 5G	NTT
	II-1-5. Terahertz Band Building Penetration Loss Characteristics for Beyond 6G	NTT
	II-1-6. Millimeter-Wave Urban Cellular Channel Characterization and High-Precision Site-Specific Simulation	Niigata Univ.
	II-1-7. THz Channel Characterization and Modeling Towards 6G Networks	Niigata Univ.
II-2. Simulation	II-2-1. Fast Propagation Simulation by CI Method for CPS Realization	NTT docomo
	II-2-2. AI-Based Radio Propagation Modeling and Data Augmentation	KDDI research
	II-2-3. Study on Machine Learning Propagation Loss Estimation Model using Point Cloud Data	Kozo Keikaku Engineering
	II-2-4. Investigation of Automatic 3D model Construction Techniques of the Surrounding Environment for Ray Tracing	Kozo Keikaku Engineering
	II-2-5. Radio Zone Interpolation by Kriging Method	NTT
	II-2-6. RNN Based Prediction Method of Wireless Communication Quality	NTT
	II-2-7. Deep Learning Propagation Loss Estimation Model Using Building Images	NTT
	II-2-8. Achievable Channel Capacity of Multi-Beam MIMO Transmission at 300 GHz	Niigata Univ.
	II-2-9. AI/ML-based Radio Propagation Prediction Technology	Tokyo Denki Univ.