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GROUP REPORT

Integrated Sensing And Communications (ISAC); Channel Modelling, Measurements and Evaluation Methodology

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Executive summary

The present document provides an overview of the current state-of-the-art in ISAC channel modelling approaches and summarizes their key limitations.

In addition, the present document provides ISAC channel modelling enhancements, including RCS modelling for complex objects, micro-Doppler modelling for small-scale motion recognition, micro-deformation modelling for structural health monitoring, and rainfall attenuation modelling for power loss caused by precipitation.

Finally, the present document presents conclusions and recommendations for future work addressing required developments for ISAC systems and radio access network architectures, including security, privacy, trustworthiness, and sustainability.

Introduction

There is growing interest in ISAC across the broader research ecosystem, including global standardization bodies, industrial stakeholders, academia, and regional collaborative projects. The present document provides a study on ISAC channel modelling, which can serve as a basis for evaluating the performance of future 6G ISAC solutions.

1 Scope

The present document outlines the scope as follows:

- Develop advanced ISAC channel models and validation through measurement campaigns and emulations, that can fill the gaps of existing channel models.
- Validate the models through feasibility analysis and measurement campaign.
- Identify and describe the corresponding use cases and the potentially suitable frequency bands.

2 References

2.1 Normative references

Normative references are not applicable in the present document.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents may be useful in implementing an ETSI deliverable or add to the reader's understanding, but are not required for conformance to the present document.

[i.1] IEEE 802.11-21bf™: "Channel Models for WLAN Sensing Systems".

[i.2] ETSI TR 138 901 (V18.0.0): "5G; Study on channel model for frequencies from 0.5 to 100 GHz (3GPP TR 38.901 version 18.0.0 Release 18)".

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