

Peer Review

Review of: "Upper Mid-Band Spectrum for 6G: Vision, Opportunity and Challenges"

Carlos Serodio¹

1. Engineering, Universidade de Trás-os-Montes e Alto Douro, Portugal

The authors present an interesting paper in the context of 6G network development. It addresses a critical and underexplored aspect of the future wireless spectrum: the Frequency Range 3 (FR3), or the upper mid-band spectrum. The authors bridge an existing gap in current standardization efforts and wireless design frameworks by presenting empirical channel measurements, theoretical analyses, and comprehensive discussions on propagation characteristics, spectrum agility, coexistence with incumbent systems, and integrated sensing and communications (ISAC).

However, it is advisable that the authors implement some improvements, namely:

1. The paper outlines numerous promising proposals for 3GPP and O-RAN enhancements, including multi-band pilot design and dynamic slot configuration. *However, these suggestions remain conceptual and are not supported by simulations, experimental validation, or comparative analysis with existing standards.*
2. The authors present several technical proposals, such as spectrum agility mechanisms, coherent multi-beam combining, and hybrid mMIMO architectures, which are mentioned in a visionary manner. *However, there is limited discussion on the associated hardware constraints, computational complexity, and integration challenges, especially in real-time mobile deployments.*
3. It would be interesting if the authors considered including a dedicated section discussing real-world implementation aspects, including hardware constraints, energy efficiency considerations, and regulatory hurdles, in the paper.

The inclusion of numerical simulations or system-level evaluations to support the proposed 3GPP and O-RAN enhancements—such as multi-band pilot design, agile timing advance, and dynamic slot configurations—would strengthen the paper.

Finally, congratulations on your work!

Declarations

Potential competing interests: No potential competing interests to declare.