Enabling LEO Satellite Vertical Handover for Massive 6G IoT Random Access

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Simulation framework Single-attribute decision strategy

INFRASTRUCTURE

Network topology + mobility

Terrestrial segment PHY/MAC implementation

- Simulation area and simulation time
- UEs randomly ulletdeployed
- gNB and satellite positions are fixed
- **Traffic models** \bullet as input: VoIP and IoT

- Channel and \bullet pathloss model
- RSSI measurements
- **Traffic load** \bullet

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- SC: Terrestrial and satellite network performance
- Baseline scheme: single attribute-based vertical handover

Intelligent Wireless Networking Lab







System model



- Broadcast measurement configuration 0.
- Meas. event triggered (Periodic report) 1.
- Network report (consolidated info from BS) 2.
- 3. HO decision strategy
- 4. HO signaling commands
- 5. UE update its connection segment if indicated and performs DATA TX

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Uplink Transmission Model

Terrestrial Segment

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The pathloss can be calculated as,

$$L_T = K - 10 \gamma \log$$

. UE's uplink data rate can be calculated as,

$R_n = B_n \log_2(1 + \text{SINR}_n)$

• RSSI = UE TX power - PL





- $g_{10}(d/d_0)$

- *K* = Unitless constant
- γ = Pathloss exponent
- *d* = Distance from UE to gNB
- d_0 = Reference distance

 R_n = Data rate of UE n B_n = Bandwidth of UE n

