TUHH
Technische Universität Hamburg-Harburg

Multilink Air-to-X Communication

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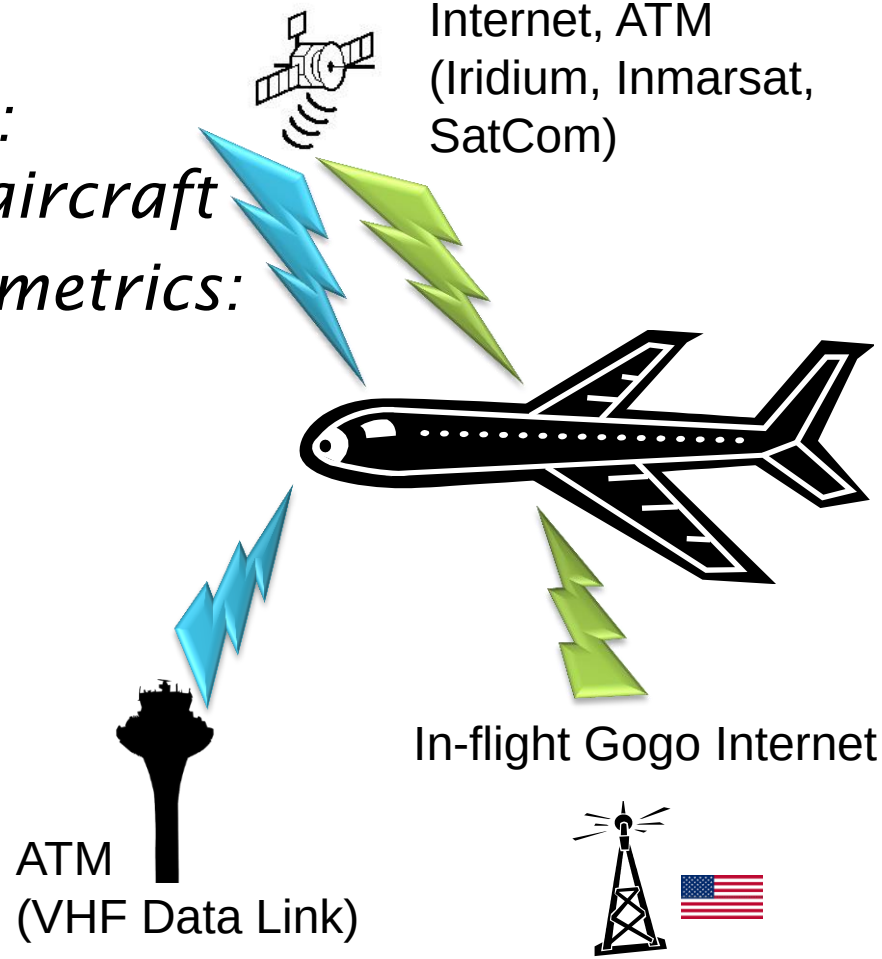
28th ComNets-Workshop Bremen

Case of Application

- *"Always Best Connected": Satellite, ground, other aircraft*
- *Important performance metrics:*
  - *Link reliability*
  - *Packet loss rate*
  - *Delay*
  - *Throughput*
- *Improved by:*
  - *Multilink transmission*
  - *Network Coding*



ATM: Air Traffic Management

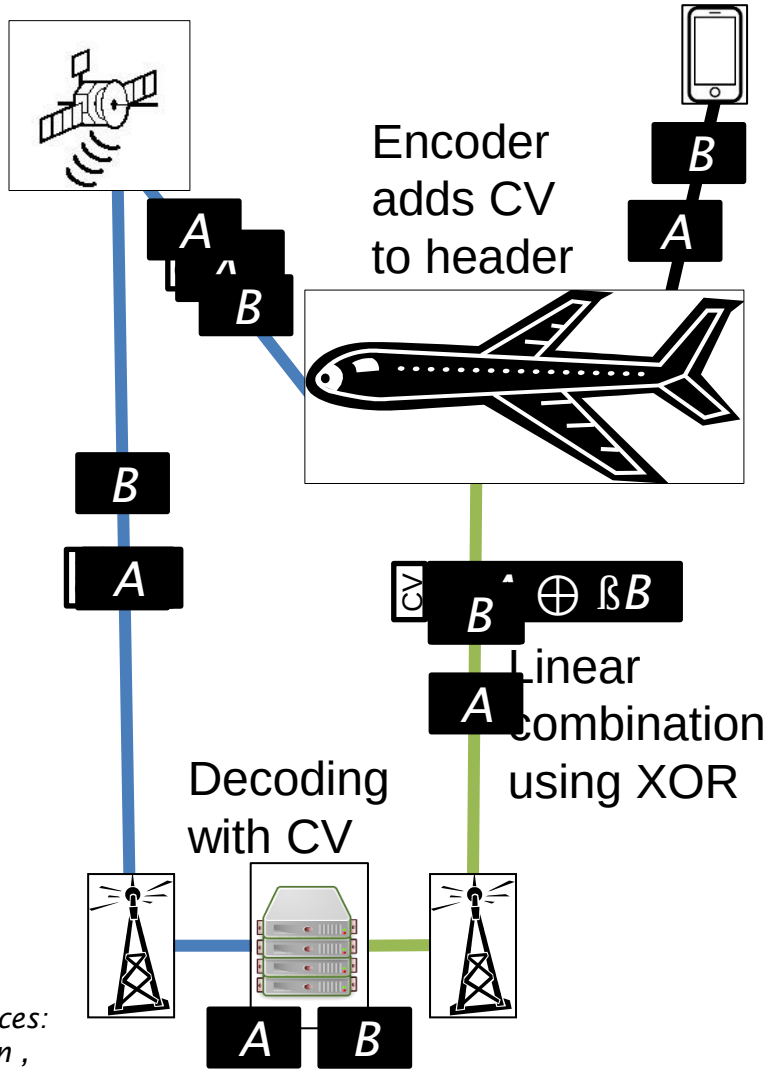
VHF: Very high frequency

Multilink

- *Uses various transmission systems at once*
- *Aims:*
  - *Reliability through redundant data transmission*
  - *Enlarge throughput by using multiple transmission systems*
  - *Load balancing by equally using transmission systems*
- *Challenges:*
  - *Determination of scheduling algorithm*
  - *Decision of transmission link*
  - *Priority of data*

Network Coding

- *Aim: Improve transmission efficiency*
- *Approach: Encoding and reconstruction of packets using Random Linear Network Coding (RLNC) [1]*
- *Challenges:*
  1. *Guarantee separation of packets at destination*
  2. *Mitigation of coding / decoding delay (waiting time)*
  3. *Tradeoff between throughput gain and network delay*



CV: coding vector

[1] Moreira, A.; Lucani, D.E., "Coded Schemes for Asymmetric Wireless Interfaces: Theory and Practice," in Selected Areas in Communications, IEEE Journal on , vol.33, no.2, pp.171-184, Feb. 2015, doi: 10.1109/JSAC.2014.2384233

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Thank you! Questions?

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