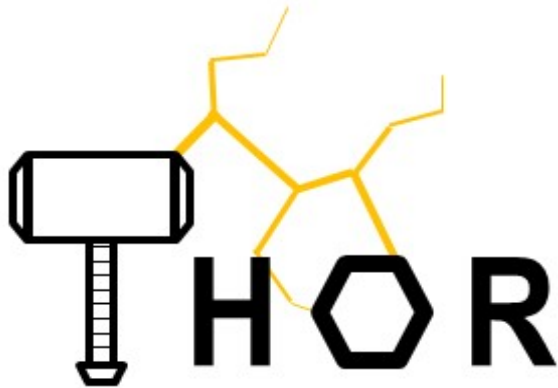


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Communications Technology

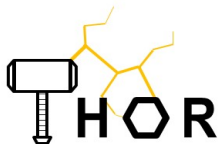
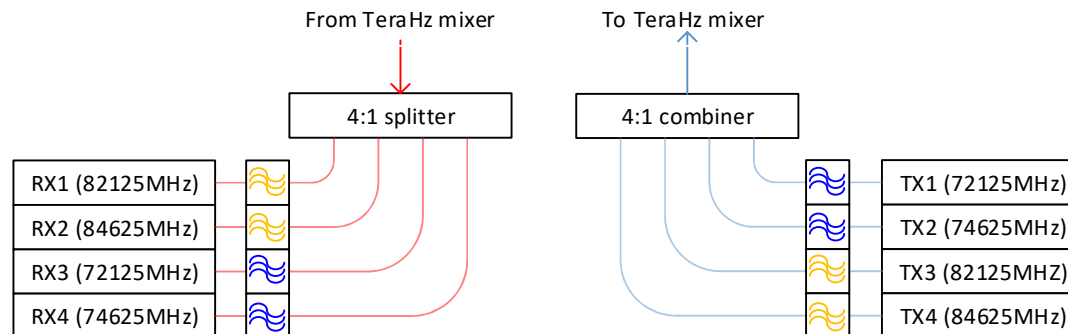


10 Gbps mm-Wave link and combing scheme for utilizing THz frequencies

H2020 EU-Japan Project ThoR Final Workshop
Ran Timar, Braunschweig, 29-30 June 2022

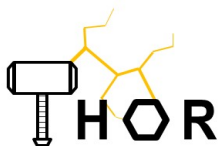
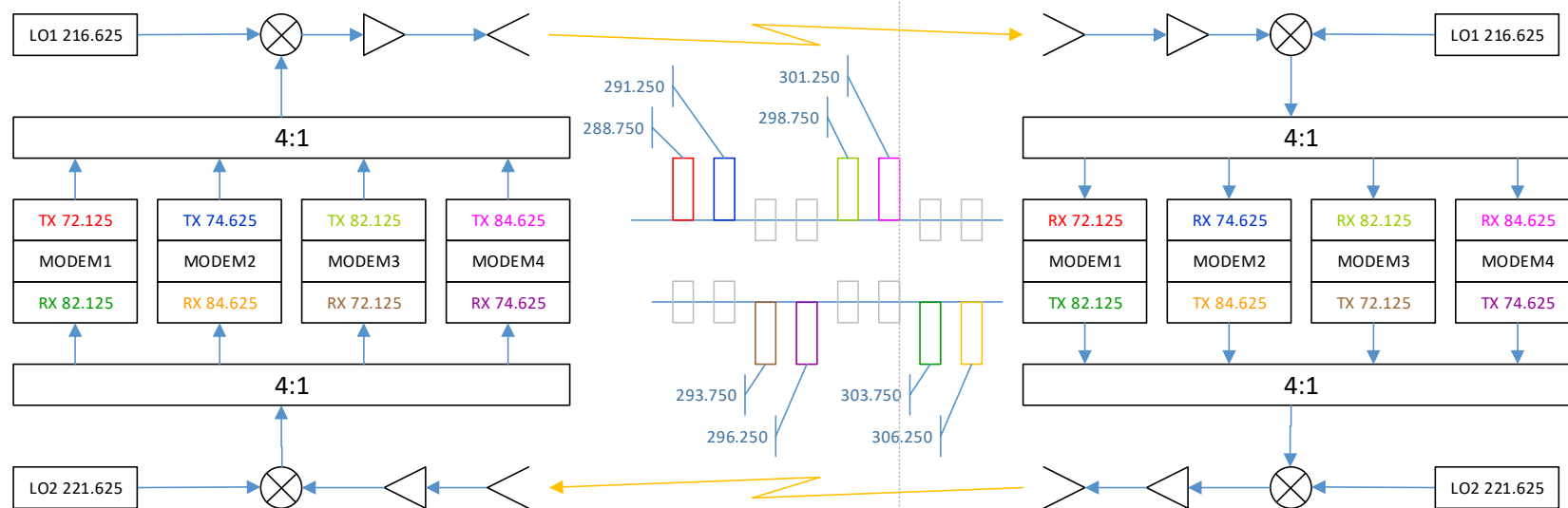
System operation principle

- Operation principle – Multiplex and up/down convert
- Rationale
 - Take advantage of mature and readily available modem technology
 - Enable a flexible architecture with a variable number of modems
- The IF frequency the modem is at E-band 70/80 GHz
- Multiple modems can be connected with offset up/down conversion
- The outcome is a multi-carrier FDM system
 - Efficient use of spectrum due to contiguous assignment of carriers
 - Independent modem operation



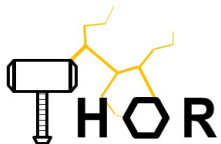
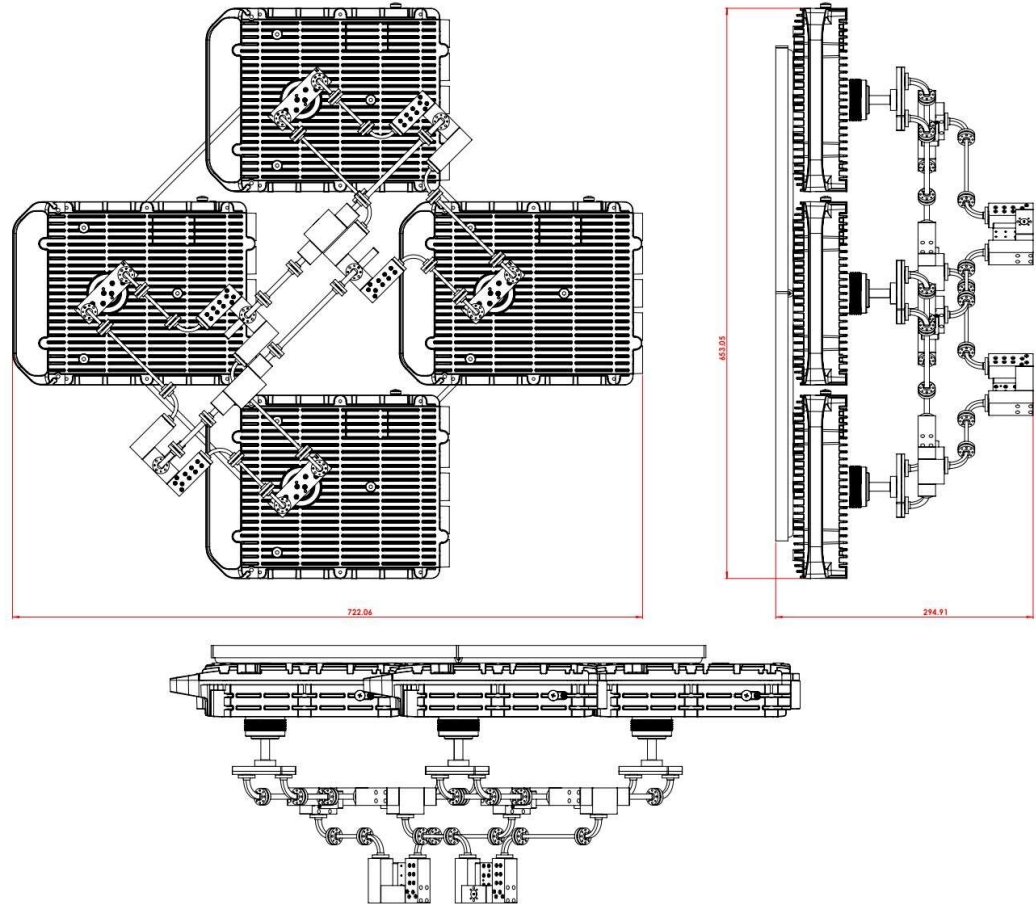
70/80GHz frequencies scheme with 4 modems

- Modem devices combined using diplexers and splitters (via waveguide)
- Combining scheme makes efficient use of spectrum

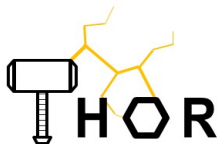
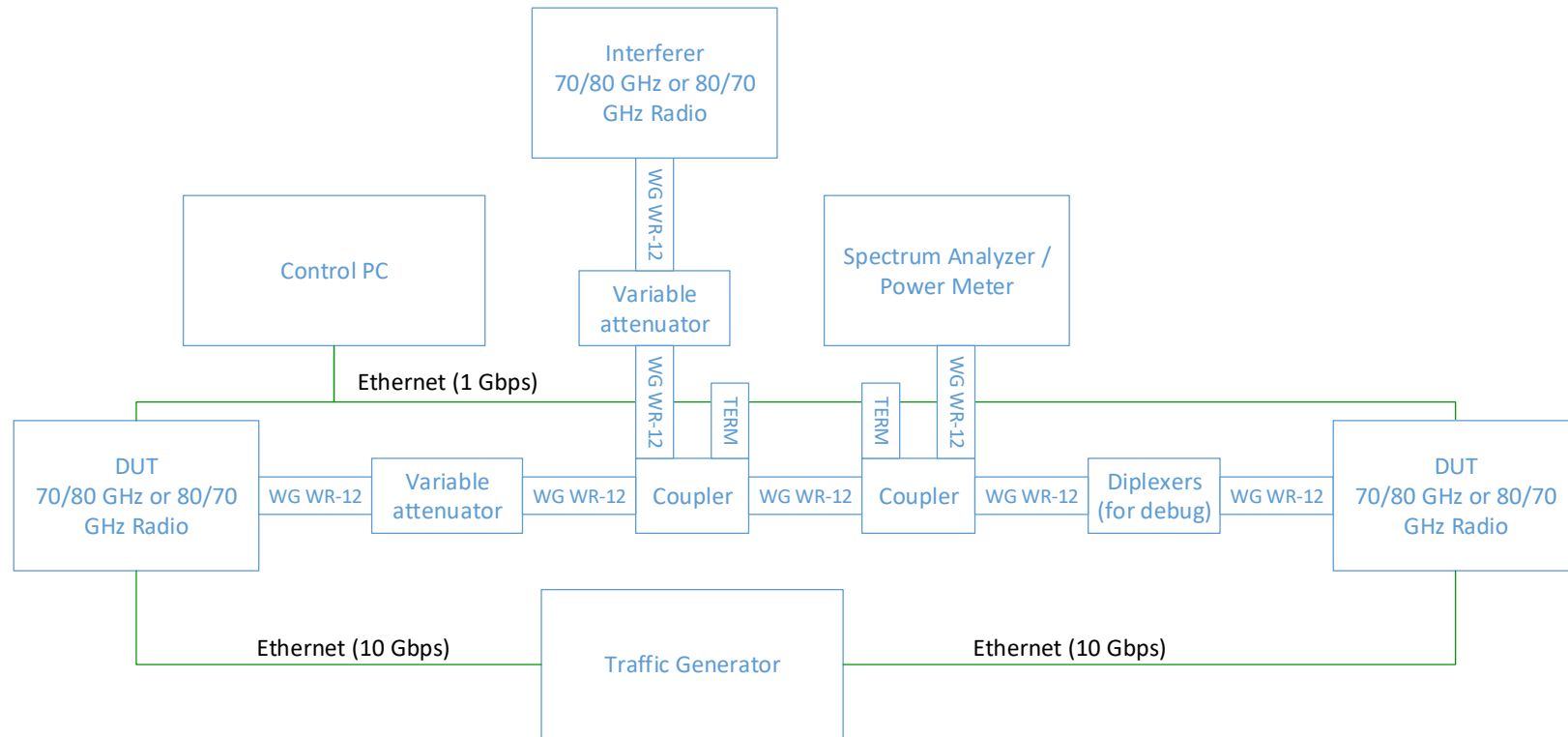


System construction

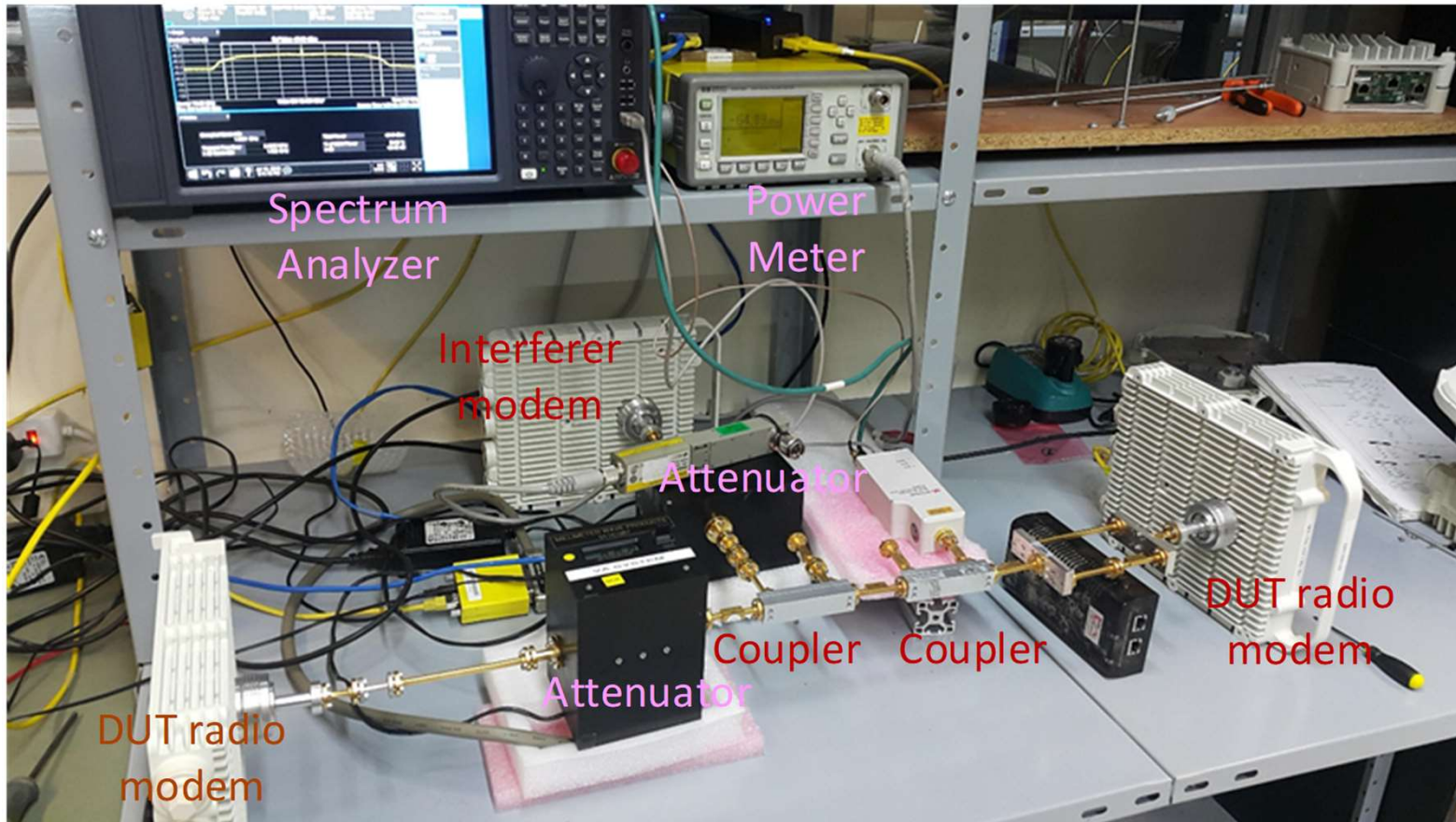
- Four 70/80 GHz modems are used in parallel
- TX/RX frequencies are separated per modem with a diplexer
- TX and RX are (separately) combined to generate to form the interface to the THz mixer
- Construction uses standard E-band waveguides



70/80GHz transceiver testing setup



70/80GHz transceiver testing setup photo



Thank you for your attention!

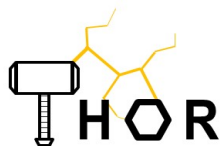
ご清聴ありがとうございました



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