

Helium-based cooling concept of the ET-LF interferometer -summary-

- $T_{\text{HeatSink}} \rightarrow 2 \text{ K}$ offers $T_{\text{Mirror}} \leq 10 \text{ K}$ potential
- Payload thermal link operation 1.7 ... 1.9 K with He-II
- TM-cryostat cooling at three temperature levels:
 - 50...80 K (outer thermal shield) \rightarrow supercritical helium
 - 5 K (inner thermal shield) \rightarrow liquid helium
 - 2 K (connection to payload) \rightarrow He-II
- $T_{\text{InnerShield}} < T_{\text{Mirror}} (\sim 10 \text{ K})$ possible
- Single He-refrigerator:
large cooling power at all three temperature levels
- Payload thermal link implementation
via long He-II-filled capillaries
- Integration of He-II-filled hollow fibers into the payload
- Prospects: Investigation of vibrational noise propagation through the hollow fibers

