

## Jena-Erfurt Fiber Link

- Two dark fibers available; typically 1 quantum and 1 classical channel
- 76 km with about 6km over-ground

### A: Brief Information

<b>Testbed Title</b>	Jena-Erfurt Fiber Link
<b>Start Point</b>	Fraunhofer IOF, Jena
<b>End point</b>	Fraunhofer-Zentrum Erfurt, Erfurt
<b>Operator</b>	Fraunhofer-Institut für Angewandte Optik und Feinmechanik (IOF)
<b>Contact</b>	Dr. Natasa Pavlovic
	Prof. Dr. Fabian Steinlechner, <a href="mailto:Fabian.Steinlechner@iof.fraunhofer.de">Fabian.Steinlechner@iof.fraunhofer.de</a>
<b>Status</b>	active

### B: Technical Information

<b>Type of Transmission</b>	fiber
<b>Length [km]</b>	76
<b>Losses [dB]</b>	23
<b>Supported Wavelengths [nm]</b>	C-band (1550 nm)
<b>Type of Fiber</b>	single mode
<b>Type of Deployment</b>	combined (6 km over ground, remaining underground)
<b>Polarization Stabilization</b>	Yes
<b>Quantum Communication Infrastructure</b>	different sources (DV, entangled, etc.) and detectors available. Availability to external users might be possible
<b>Available Infrastructure for external Parties</b>	fiber access possible limited internet access (no LAN, restricted WLAN)

## C: Additional Information

<b>Linked Projects</b>	<ul style="list-style-type: none"><li>• QuNET: <a href="https://qunet-initiative.de">https://qunet-initiative.de</a></li><li>• Q-Fiber: <a href="https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/q-fiber">https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/q-fiber</a></li><li>• QuNET+ProQuake: <a href="https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/qunet-proquake">https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/qunet-proquake</a></li><li>• QuNET+ICLink: <a href="https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/qunet-iclink">https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/qunet-iclink</a></li><li>• Q-net-Q <a href="https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/q-net-q">https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/q-net-q</a></li></ul>
<b>Press Release and Publications</b>	<ul style="list-style-type: none"><li>• <a href="#">QuNET initiative: One step closer to highly secure quantum communication</a>, 06.2023</li><li>• <a href="#">Robust Time Transfer with Single Photons on Hybrid Quantum Communication Scenarios in Fiber and Free-Space</a>, 06.2023</li></ul>
<b>Demonstrated Milestone</b>	<ul style="list-style-type: none"><li>• active polarization stabilization achieved</li><li>• QKD based on BBM92 protocol demonstrated</li><li>• entangled QKD demonstrated with about 200 bit/s secure key rate (cooperation with QOJ)</li></ul>
<b>Outlook</b>	<ul style="list-style-type: none"><li>• On-going inclusion in different system tests and experiments.</li></ul>
<b>Suggested Use Cases</b>	
<b>Other Comments/ Information</b>	<ul style="list-style-type: none"><li>• Attached Campus network and free-space link available</li></ul>