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Photonic technologies for future Very Large Volume Neutrino Telescopes

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Photonics, being a key technology in the present telecommunication networks already, will also strongly empower the realization of future very large volume neutrino telescopes. In general, photonics will serve as enabling technology in wide-area or large volume distributed networks for scientific research, connecting a large number of sensors to a central data collection centre. All-optical high-speed data-serialising, data transmission and data recovery enables more efficient data collection, higher data precision and allows new concepts for 'collection of all data'. Novel network architectures and photonic components allow connection of more signal sources and expansion of the volume covered by the telescope. During assembly, deployment and operation of the telescope, photonic sensors can monitor structural parameters, like strain in the cables and humidity in electronic compartments. During operation, optimised sensor cables can monitor parameters in the direct environment of the telescope, such as e.g. temperature distributions or chemical parameters. The presentation will review some components and technologies for 'all-photonics-based' data collection and sensing in future very large volume neutrino telescopes.

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