

RF over fibre optic backplane for phased array antennas

RFoF technology enables a path for low loss signal transmission over longer distances, carry huge bandwidth of data, and is also immune to electrical noise. The paper discusses the technology, design, and methods for implementing it for phased array antennas application. The RFoF backplane is very much compact and suitable for phased array antennas, these replace the need for bulky RF cables, which is capable of carrying the output of the only single element. MPO (multi-fiber push-on) developed to provide multi-fiber connectivity in one connector to support higher bandwidth and higher density applications. The purpose of the project is to design RF over fiber-optic backplane for the focal plane array, it consists of 144 Vivaldi antenna elements with frontend electronics (LNA) behind it. The low cost, high dynamic range signal transport system is designed and implemented with multi-fiber push on technology. The laser transmitter section is directly connected to the RF output of elements, so this is made very lighter in weight keeping the overall weight of feed to be minimum, making it suitable to be mounted over the prime focus of dish antenna. The designed system supports the frequency range from 500 to 2000 MHz and has an optical budget of 8 dB which will support an additional distance of 32 km at 1310 nm wavelength.

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