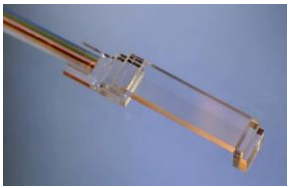
Ultra-High-Accuracy Fibre Arrays for High Coupling Efficiency Demanding Applications

Reference: TD-NL-1017

TECHNOLOGY DESCRIPTION

The technology of MicroAlign's ultra-high-frequency fibre arrays allows for individual and simultaneous manipulation and fixation of closely placed fibres with high precision (±100 nm). The fibre arrays are in a core-based alignment and have a high coupling efficiency suitable for integrated photonic chips and micro lens arrays. Application areas include using fibre markets demanding high performance (quantum computing), working with only a few photons (spectroscopy) or where (optical) energy efficiency is a must (radar and space-to-Earth communication). For analogue optical signals, the reduced variation in optical coupling efficiency across channels results in more consistent performance and improved minimum detected optical power. This leads to a more uniform dynamic range between channels. For digital signals, optical coupling efficiency means reduced laser power requirements, improved optical performance and extended light transmission distances.



INNOVATIVE ASPECTS

- Ability to provide per-fibre alignment within optical arrays
- Improved average coupling efficiency
- Enhanced channel coupling uniformity and suppressed misalignment for consistent performance
- Extended laser lifetime meaning reduced laser power needed
- Scalable design with potential to scale with minimal impact on core positioning accuracy
- Improved optical sensing performance due to the higher coupling efficiency
- High-accuracy alignment minimises optical losses and ensures, efficient photon capture

TECHNOLOGY READINESS

TRL 3 (2025)

COUNTRY OF ORIGIN

Netherlands

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TAGS	#FibreArrays	#HighCoupling Efficiency	#CoreBased Alignment	#Optical Communication	#Data Transmission	#Photonics
APPLICATION AREAS	Data Processing	Electrical & Electronic Engineering	Quantum Computing	Optical Systems	Ground Data Systems	Mission Operations

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