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A continuous ADR table-top optical cryostat for LTD applications

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The application of LTD suffers from the complexity and the lack of reliability of low temperature cryogenic solutions. While dilution cryostats offer a versatile solution for development purposes, they have several drabacks to build a user-friendly systems that requires a high reliability. We discuss the design of a solution based on a continuous ADR cryostat for LTD application in the range 50 - 200 mK.
As an example, the design choice and the integration of a full readout system based on a KIDs array for astrophysical applications or millimeter wave imaging is disussed.
Our ADR cryostat is able to provide two continuous stages, one at 1K for cold optical filters mounting and heat intercept, and one at a low temperature (50 mK) for the detector array. The complete system is compatible with a 4K-range cryocooler that provides the required pre-cooling temperature.
We discuss the main limitations of the system and identify the key improvements required to further increase the system performance.

Less than 5 years of experience since completion of Ph.D

Y

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N

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