

Cryogenic refrigerator for quantronics

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PhD may follow: Yes

Summary :

Full description :

Thanks to a Regional grant founding, The INAC low temperature lab, is going to develop a compact cooling system targeting 2 K. Currently, commercial cooling system are voluminous and energy consuming. Ultimate temperatures are close to 3 K and electrical consumption is close to 3 KW. There is then an urgent need of compact and user friendly cryogenic cooling solution. This solution would have a great interest for all the quantronic labs for example.

The technical answer we propose is a combo between a pulse tube (PT) refrigerator and a Joule Thomson (JT) cooler. The pulse tube refrigerator is a reliable and possibly cheap solution for this application. The PT cooler would precool the JT cooler to about 10 K to 15 K and then the JT cooling loop would reach low temperatures as 2 K.

During this master internship, we will propose to work on the JT cooling first prototype. Assembly and testing activities will be held by the candidate with the help of the technical staff.

Requested skills :

thermodynamic, mecanic and fluid mecanic, practical sens, "handy", interest for experimental work