Cold Nitrogen Gas Generator

R. Steinmann, P. van der Linden

ESRF, 6 rue Jules Horowitz, Grenoble, F-38043France

In order to reach temperatures between 100 and 300 Kelvin one can use very diverse systems such as Helium flow cryostats, liquid Nitrogen flow cryostats, closed cycle refrigerators or expansion systems. We have built a cold nitrogen gas generator which can be inserted in a standard liquid nitrogen vessel and delivers a stream of nitrogen gas of 80-90K at the tip of a vacuum isolated syphon; this syphon can be inserted in a cryostat. The system is inexpensive to build, easily included in a cryostat, simple and reliable in use. As it runs on a stream of gas rather than liquid it is also vibration free, economical with cryogen liquid and yields very stable temperatures. For a gas flow of 5 liter per minute a cooling power of about 1 Watt is available at 100 Kelvin. The cold nitrogen gas generator has been used for two very different cryogenic systems at the ESRF and we currently have more projects under development.