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Development of a low cost, low temperature cryocooler using the Gifford McMahon cycle A. RAMANAYAKA, R. MANI, Georgia State University — Although Helium is the second most abundant element, its concentration in the earth's atmosphere is fairly low and constant, as the portion that escapes from the atmosphere is replace by new emission. Historically, Helium was extracted as a byproduct of natural gas production, and stored in gas fields in a National Helium Reserve, in an attempt to conserve this interesting element. National policy has changed and the cost of liquid Helium has increased rapidly in the recent past. These new circumstances have created new interest in alternative eco-friendly methods to realizing and maintaining low temperatures in the laboratory. There have been number of successful attempts at making low temperature closed cycle Helium refrigerators by modifying an existing closed cycle system, and usually the regenerator has been replaced in order to achieve the desired results. Here, we discus our attempt to fabricate a low cost, low temperature closed cycle Helium refrigerator starting from a 15K Gifford McMahon system. We reexamine the barriers to realizing lower temperature here and our attempts at overcoming them.

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