は，時間と共に低周波側に移動し，平均エネルギーの増大が確認できた。ピークの2Ω_eからのずれは，高速電子群が50 keVのMaxwell分布であるとすれば説明できる。これは硬X線波高分析の結果とも矛盾しない。また輻射強度は，高周波印加と同時に急激に増大し,約10msecで飽和する。これは，エネルギーと密度が急激に増大することを示している。

16. THERMAL INSULATION
– Minimization of Heat Leak Into a Cryogenic Storage Space –

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The final aim of the entire research is to find the most technically effective and economic way to store large quantities of liquid helium with minimal losses due to evaporation. Before design and construction of the final storages pertinent heat transfer data had to be obtained. To do this a 220-liter SUS 304 test dewar was constructed.

The helium container of the dewar hangs by the neck around which there is a 25-litre liquid nitrogen tank. Surrounding the container is a copper radiation shield which is shielded from the outer jacket radiation by 30 layers of Al-Polyester-Al superinsulation foils. Additionally, the shield is cooled by a "cryominirefrigerator" to 45 K. Around the refrigerator head is wound a manganin-wire heater used to raise the shield temperature as required. The dewar has 59 temperature measurement points.

During this run no superinsulations were wrapped around the container. The main objectives were to determine the effective emissivity, ϵ between the container and shield surface; and, the efficiency, E of the evaporated helium gas in stopping the conduction heat leak, C from reaching the container from the liquid nitrogen temperature of 77.3 K.

To do this, two main experiments, based on the liquid evaporation loss method, were conducted. In the first, a metal-oxide resistor heater was directly introduced into the liquid. The heating power was varied to different values and the corresponding steady-state evaporation flow rate, f was measured. In the second experiment, the radiation shield temperature was varied and again f was measured.

From the results of Experiment 2 the value $\epsilon = 0.027$ was estimated. It was confirmed when, by using it, results from both experiments agreed. The conduction stoppage efficiency was subsequently obtained as $E_0 = 80\%$.

Still, it was observed that under these circumstances the ratio of the conduction leak, C reaching the container to the minimum radiation, R from the shield was $C/R = 5$. This is large and could be cut to less than 3 by replacing a part of the SUS 304 neck tube with CFRP. Preparations for this have been accomplished and this modification will be performed before any further experimental work resumes.

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