A Persistent Current

1.3 GHz (30.5 T) NMR

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A PERSISTENT CURRENT 1.3 GHz NMR

- 30 T-class persistent current magnet with SUPERCONDUCTING JOINTS
- Analysis of human brain amyloid to address ALZHEIMER’S DISEASE
- The technologies are open to be used for much HIGHER FIELD (35-50 T) and HIGHER TEMPERATURE (~77 K)

Connected in series, $L \sim 1000$ H

One of the preliminary designs by Dr. M. Hamada of JASTEC

Y. Yanagisawa, MT25, Amsterdam, The Netherlands, Aug. 28 – Sep. 1, 2017
The Challenge: “PERSISTENT CURRENT MARATHON”

The total resistance $R_{\text{TOTAL}} \approx 0.1 \text{ nΩ}$ is achieved by combining various components with different resistances. The total resistance is calculated as follows:

- $RL \times 1$: resistance of 1 component
- $RR \times 16$: resistance of 16 components
- $R(L)B \times 1$: resistance of 1 component
- $BB \times 60$: resistance of 60 components
- $BL \times 1$: resistance of 1 component

These components are connected in series, resulting in a total resistance of less than $10^{-12} \text{ Ω/joint}$. Cooper-pair runs 4 Amsterdam full marathons through oxide and metal circuit with 0.1 nΩ!

Animation by H. Mochida
The Marathon Has Started
Intermediate Grown Superconducting (iGS) joint

**Superconducting joints using Bi-added PbSn solders**

“Superconducting joints using Bi-added PbSn solders”

**NEWS!**

**Bi-2223 / NbTi joint**


Plenary presentation We-Mo-P16-02 given at MT25, 29 August - 01 September 2017, Amsterdam, The Netherlands.

Y. Yanagisawa, MT25, Amsterdam, The Netherlands, Aug. 28 – Sep. 1, 2017
Persistent current 1.3 GHz NMR:
One of the most challenging goals of MT, making a huge impact on coping with Alzheimer's disease.

The persistent current marathon with superconducting joints has started towards \textbf{MT30} (2027)!