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High quality single crystal growth and de Haas-van Alphen effect in transuraunium compounds

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We succeeded in observing the de Haas-van Alphen (dHvA) oscillations in $NpNiGa_5$ single crystals, which were grown by the Ga-flux method.[1] This is the first dHvA observation in transuranium compounds. The cyclotron effective masses were moderately enhanced, ranging from 1.8 to 4.9 m_0 (m_0: rest mass of an electron). From an intensive change of the dHvA amplitude at a critical field of 80-90 kOe and the temperature dependence of the electrical resistivity, $NpNiGa_5$ is most likely an antiferromagnet with a Néel temperature, $T_N = 30$ K and an antiferromagnetic easy-axis along the [110] direction.

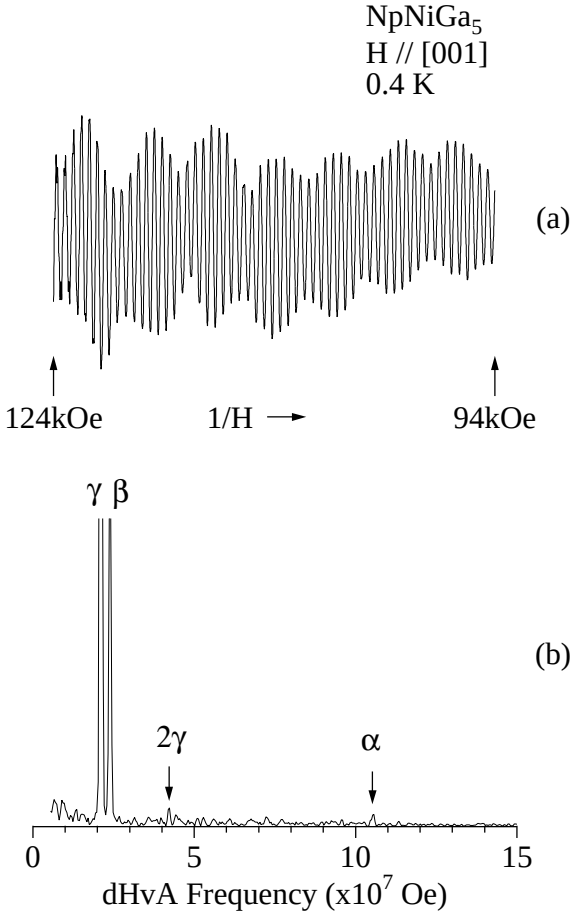

Figure 1: (a) Typical dHvA oscillations and (b) its FFT spectrum in $NpNiGa_5$.

[1] D. Aoki, E. Yamamoto, Y. Homma, Y. Shiokawa, A. Nakamura, Y. Haga, R. Settai, Y Ōnuki, submitted to J. Phys. Soc. Jpn.