and critical temperature, taking account of the real energy spectrum of superconductor, in a manner proposed by Geilikman and Kresin [15], explaining anomalous superconductor properties.

In conclusion we note that in all our experiments dT_c/dp of superthin aluminium films was always larger than for massive material [16] and varied from 3 to 4×10^{-5} °K/atm for different films.[1])

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References

[1] I. Bardeen, L. Cooper, and I. Schrieffer, Phys. Rev. **108**, 1175 (1957).
[2] J. Swihart, Proc. Xth Internat. Conf. Low Temperature Phys., Moscow 1966 (p.).
[3] N. B. Brandt and N. I. Ginzburg, Uspekhi fiz. Nauk **85**, 3 (1965).
[4] M. Garfinkel and D. Mapother, Phys. Rev. **122**, 459 (1961).
[5] A. A. Galkin and V. M. Svistunov, phys. stat. sol. **26**, K55 (1968).
I. P. Franck and W. T. Keeler, Phys. Rev. Letters **20**, No. 8 (a) (1968).
N. V. Zavaritskii, E. S. Itskevich, and A. N. Voronovskii, Zh. eksper. teor. Fiz. Pisma **7**, 271 (1968).
[6] A. A. Galkin, A. P. Dikii, and V. M. Svistunov, phys. stat. sol. **30**, K107 (1968).
[7] D. Douglas and L. Falikov, Progr. Low Temperature Phys. **4**, 97 (1964).
[8] E. S. Itskevich, Prib. i Tekh. Eksper. **4**, 148 (1962).
[9] L. D. Jennings and C. A. Swenson, Phys. Rev. **112**, 31 (1958).
[10] I. B. Berman, N. B. Brandt, and N. I. Ginzburg, Zh. eksper. teor. Fiz. **53**, 124 (19).
[11] D. Finnemore and D. Mapother, Phys. Rev. **140**, A507 (1965).
[12] T. Clark, J. Phys. B **1**, 732 (1968).
[13] D. Bowen and G. Jones, Proc. Roy. Soc. **254**, 522 (1960).
V. I. Makarov, Dissertatsiya, Kharkov 1965.
[14] W. Gey, Phys. Rev. **153**, A422 (1967).
[15] B. T. Geilikman and V. Z. Kresin, Fiz. tverd. Tela **7**, 3297 (1965).
[16] I. L. Olsen, et al., Rev. mod. Phys. **36**, 168 (1964).

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[1]) The effect of high pressure on T_c of Al thin films was reported by A. A. Galkin and V. M. Svistunov on the (Soviet-French) Bacuriani colloquium on February 1968.

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The Dislocation Structure of Glide Bands in LiF Crystals Stressed at $T = 300$ to 1.4 °K

By

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The etch pit density and the shear strain in screw and edge glide bands were measured on LiF crystals, stressed at temperatures of 1.4 to 300 °K, and the temperature dependence of the average slip distance of screw dislocations and the probabilities of cross slipping are evaluated. The slip distance decreases with the temperature down to 78 °K, remaining constant, however, at lower temperatures. The cross slip probabilities increase continuously with decreasing temperature.

По величинам сдвига и плотностям ямок травления в винтовых и краевых полосах скольжения изучались температурные зависимости средней длины пробега винтовых дислокаций λ и вероятности их поперечного скольжения в процессе деформации сжатия кристаллов LiF при $T = 1.4$ до 300 °K. Установлено, что величина λ уменьшается при понижении температуры от 300 до 78 °K, а затем остается постоянной вплоть до 1.4 °K. Вероятность поперечного скольжения дислокаций с уменьшением температуры непрерывно возрастает.

A number of phenomena [1 to 3], not being observed near room temperature, were found by birefringence investigations of alkali halide crystals deformed at liquid helium temperatures. The phenomena are associated with the kinetics of the initiation of elementary slip and slip band growth [4]. The phenomena consist in a strong temperature dependence of the optical elastic limit (observed even at helium temperatures), a decrease of the number of slip events and of their velocity, the presence of screw dislocation dipoles in the dislocation structure of indentation induced rosettes obtained at liquid helium temperatures, etc. A further understanding of the phenomena, mentioned above, may be gained mainly by studying in detail the properties of deformation at liquid helium temperatures. Therefore, the etch pit densities in screw and edge glide bands and the shear strain inside the bands were measured at temperatures in the range from 1.4 °K to room temperature. By the help of the data it was possible to calculate the average slip distance of screw dislocations and the cross slip probabilities during the band growth.

The experiments were carried out on lithium fluoride crystals, not being hygroscopic and therefore suitable for working at room temperature. The crystals, containing about 3×10^{-3} % Mg, were grown by the Kyropoulos technique, then annealed for 48 h at 750 °C, and cooled at a rate of 5°/h. The specimens were cleaved from a large block along the cube planes and had a size of $5 \times 5 \times 15$ mm³. The initial dislocation density in the specimens did not exceed 10^4 cm^{-2}.

The specimens were deformed along the [001] direction at a rate of 0.4 mm min^{-1} at temperatures of 300, 78, 4.2, or 1.4 °K. At all temperatures, the total strain amounted to about 2%. The crystal surface is not completely covered