The samples were prepared in such a way that the same substrate carried thick- and thin-film junctions (the configuration of the samples is shown in Fig. 3a). This enabled us to obtain, in the same experiment, additional information on the isotropic energy gap $2\Delta_{av}$. This method eliminated the error in the determination of the pressure when the results for the isotropic and aniso-tropic components of the gap were compared. At all pressures, we found that $\Delta_{av} = (\Delta_1 + \Delta_2)/2$. The pressure-induced change in the energy gap of thin films was in agreement with our earlier results.[4]

The features at $eU > \Delta_{Al} + \Delta_{Pb}$, associated with the phonon spectrum of the superconductor, were investigated using thin-film (~1000 Å) superconducting junctions. An investigation of the S-I-S system enabled us to resolve (and obtain information on) three peaks in the phonon spectrum obtained for the transverse polarization under pressure (Fig. 5). Table I gives the results of the present investigation, as well

as the results obtained by others.[5,6,30] It is evident from Table I that, basically, the various tunnel-effect data are in good agreement.

The main results of the theory of anomalous super-conductors due to Geĭlikman and Kresin[31]

$$\frac{2\Delta}{kT_c} = 3{,}52\left[1 + 5.3\frac{T_c^2}{\omega_0^2}\ln\frac{\omega_0}{T_c}\right], \tag{2}$$

and of the theory due to McMillan[32]

$$T_c = \frac{\omega_c}{1.73}\exp\left[-\frac{1.04(1+\lambda)}{\lambda - \mu^*(1+0.62\lambda)}\right] \tag{3}$$

can be applied to the experimental results.[6] For convenience, we can rewrite Eqs. (2) and (3) in the differential form:[33]

$$\frac{d\ln T_c}{dP} = \left[\frac{d\ln 2\Delta}{dP} + 5.3\frac{d\ln \omega_0}{dP}\cdot\left(2\ln\frac{\omega_0}{T_c}-1\right)\frac{T_c^2}{\omega_0^2}\right]\left[1 + 5.3\frac{T_c^2}{\omega_0^2}\right.$$
$$\left.\times\left(2\ln\frac{\omega_0}{T_c}-1\right)\right]^{-1}, \tag{4}$$

$$\frac{d\ln T_c}{dP} = \frac{d\ln \omega_c}{dP} + \frac{1.23}{(\lambda - 0{,}11)^2}\cdot\sum_{v}^{3}\lambda_v\left(\frac{d\ln I_v}{dP} - 2\frac{d\ln \omega_v}{dP}\right). \tag{5}$$

Here, ω_0 is the characteristic frequency of phonons (ω_t or ω_l); ω_c is the cutoff frequency; λ is the elec-
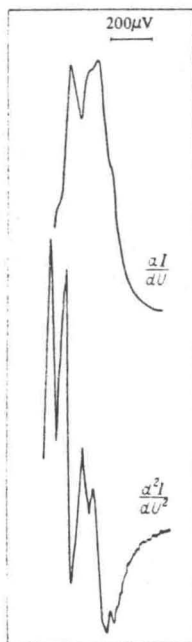

FIG. 2. Complex structure of the $(dI/dU) = f(U)$ and $(d^2I/dU^2) = F(U)$ characteristics of an Al-I-Pb* sample in the vicinity of the sum of the energy gaps $\Delta_{Pb} + \Delta_{Al}$, T = 1.16°K.
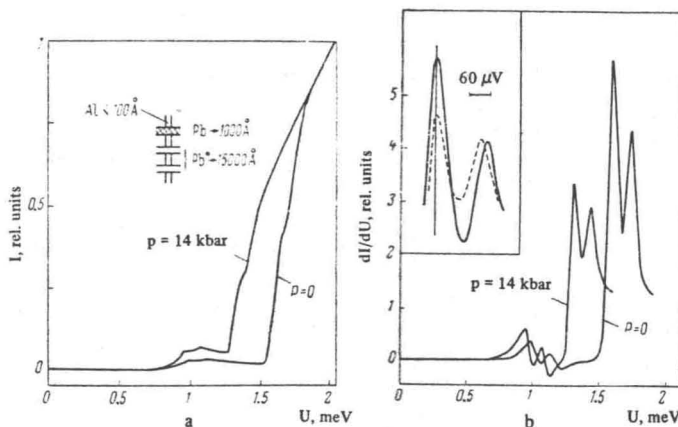

FIG. 3. Influence of high pressures on the characteristics of an Al-I-Pb* sample: a) I = f(U); b) (dI/dU) = F(U), T = 1.17°K. The insert shows the pressure-induced shift $\Delta_2^{Pb} - \Delta_1^{Pb}$ (the dashed curve corresponds to a pressure of 14 kbar).

Table I. Results of investigations of the tunnel effect in lead under pressure

	Investigated quantity X		
	$2\Delta_1$	$2\Delta_{cp}$	$2\Delta_2$
X, meV	$2.56\pm0{,}01$	2.72 ± 0.01 2.71 [6]	2.85 ± 0.01
dX/dP, 10^{-5} meV/bar	$-2.22\pm0{,}15$	-2.34 ± 0.15 -2.16 ± 0.2 [6]	-2.45 ± 0.15
$d\ln X/dP$, 10^{-6} bar^{-1}	$-8.7\pm0{,}6$	-8.6 ± 0.6 -10.1 ± 0.8 [5] -8 [6]	-8.6 ± 0.6

	Investigated quantity X			
	ω_l'	ω_l''	ω_t'''	ω_l
X, meV	3.88 ± 0.02	4.52 ± 0.02 4.45 [6] 4.6 [30]	$4.9\pm0{,}02$	$8{,}55\pm0{,}02$ $8{,}5$ [6]
dX/dP, 10^{-5} meV/bar	2.6 ± 0.4	3.3 ± 0.4 4.5 ± 0.6 [6]	$3.3\pm0{,}4$	6.4 ± 0.4 6 ± 0.6 [6]
$d\ln X/dP$, 10^{-6} bar^{-1}	6.75 ± 1	7.28 ± 1 5.3 ± 0.7 [30] 10.1 [6]	6.75 ± 1	7.5 ± 0.5 7 ± 0.7 [30] $7{,}05$ [6]