

ACOUSTICS2008/2941 **$V(z)$ oscillations in acoustic microscope at upward defocusing**

Anton Kozlov and Vladimir Mozhaev
MSU, Leninskie Gory, Bld. 1-2, 119991 GSP-1 Moscow, Russian Federation

Acoustic microscopy is widely used for imaging and study of elastic properties of transparent and opaque materials. As a rule, multiple periodic oscillations in the output signal V of a reflection acoustic microscope can be observed in the case of negative defocusing of the wide-angle acoustic lens, i.e. when its focus is a distance z below the solid sample surface. The main well-known mechanism for $V(z)$ oscillations is the interference of radiation reflected perpendicularly from the sample surface and re-radiation of leaky Rayleigh waves generated on the sample by the lens. This effect explains high contrast imaging in reflection scanning acoustic microscopy, and it is a popular method to study properties of solids by measuring Rayleigh wave speeds. As it is shown in this work, bulk acoustic waves in the sample can also give rise to $V(z)$ oscillations. A new mechanism of such oscillations is predicted in the case of positive defocusing (focusing above the sample surface) in acoustic microscopy of anisotropic plates exhibiting negative acoustic refraction. The ray model of this effect shows a possibility to find a relationship between extrema of $V(z)$ curve and separate points on the acoustic slowness surface of the sample.