Abstracts

The Role of Acoustic Surface Waves in Signal Processing

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On Fig. 1 is shown an actual plot of wavecrests on the surface of crystal. Notice that these wavecrests are not regular, they appear to be relatively flat within the beam then they appear to fall back rapidly away from the beam center. That is because lithium niobate crystal is highly anisotropic, and the waves moving slightly off the beam direction tend to move more slowly than waves directly on the beam direction. The straight-crested surface wave is generated on lithium niobate with a transducer shown in Fig. 2. The position of the fingers in the transducer matches the position of the crests and troughs of Fig. 1, and if an electrical signal at the appropriate frequency is applied to the transducer then a surface acoustic wave beam radiates from these transducers. The transducer is relatively efficient--a bit less than half the available electrical energy is put into the desired acoustic wave with this particular design.

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