

Development of P wave and S wave GHz buffer rod-transducer for DAC experiments

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P wave and S wave GHz buffer rods are now under developing. Both the transducers will be used for ultrasonic velocity measurement under high pressure in the combination of diamond anvil cell. The way of electrode for transducer is found to be critical for stable operation of buffer rod; I examined Au sputtering on the ZnO transducer, and got reasonable results. Simultaneously, I examined Sapphire, YAG, TiO₂, Si, and SiO₂ crystals for feasibility of GHz buffer rod, and found substantial attenuation of GHz wave in Si and SiO₂ crystals. I confirmed the performance of Sapphire, YAG, and TiO₂ buffer rods with observing the reflection pulse from diamond plate (~2 mm thickness). I also detected a P-S conversion signal in YAG crystal; it is almost ready to assemble S wave GHz buffer rod made of YAG crystal. Furthermore I have a plan to make diamond buffer rod as well in near future.

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