

平成 30 年 2 月 21 日

応用物理学会北海道支部

会員各位

応用物理学会北海道支部

講演会のお知らせ

下記講演会を開催いたしますので、多数ご参加下さいますようお願い申し上げます。

演題：Recent development and trend of heat conduction analysis for nanostructured bulk and phononic crystals

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日時：平成 30 年 3 月 5 日 (月) 11:00～12:00

場所：北海道大学工学部応用物理学専攻会議室 (A3-62)

後援：応用物理学会北海道支部

講演の要旨

Phononic crystal (PnC) has been gaining much attention as advanced structuring for manipulating phonon transport. The peculiar thermal property of PnC is that it has intrinsically small thermal conductivity comparable to amorphous while remaining high crystalline. However, actual PnC crystal in experiment does not show expected thermal property since phonon does not preserve its coherence (phase information) due to disorder of structural periodicity, surface roughness, and anharmonicity. In order to realize the low-coherence-loss PnC, knowledge on characteristic lengths of phonons such as mean free path and coherence length is indispensable. Even though recent anharmonic phonon calculations based on first principles have quantitatively revealed magnitude of phonon mean free path, investigations of coherence length, being a length scale for wave nature of phonon, are still limited. In this seminar, we introduce recent developments of anharmonic phonon calculations for mean free path and present recent results for phonon coherence length, and heat conduction in actual PnC with holes involving coherent and incoherent phonons.

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