Spectral singularity in composite systems and simulation of laser resonant chamber[1] XIZHENG ZHANG, Beijing CSRC — A non-Hermitian system with spectral singularity (SS) exhibits fascinating phenomena which never appear in a Hermitian system. We investigate the existence of SS for a composite system which is consisted of two separated scattering centers A and B embedded in a one-dimensional free space, one of which is non-Hermitian at last. We show that the composite system has a SS at k_c if the reflection amplitudes $r^A(k_c)$ and $r^B(k_c)$ of two scattering centers satisfy the condition $r^A_R(k_c)\, r^B_L(k_c)\, e^{i2k_c(x_B - x_A)} = 1$, based on the theorem proposed by Ali (PRL 102, 220402 (2009)). Multi-scattering-centers generalization of the theorem is also obtained. As an application, we construct a simple system to simulate the resonant chamber for generating laser light.

[1]Spectral singularity in composite systems and simulation of laser resonant chamber

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