

Local and latent symmetries and their generalization to control localization

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Following up on a brief review on local symmetries we will address latent symmetries and isospectral reduction techniques in graph theory with applications to physical setups. We show that flat bands can be generated from a hidden symmetry of the lattice unit cell. This allows us to construct them by using a latently symmetric unit cell and multiplet interconnections. We demonstrate that the resulting flat bands are tunable and preserve the latent symmetry. The developed framework may offer fruitful perspectives to analyze and design flat band structures in a variety of physical systems, including cold atoms, optical and acoustic wave setups.