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Flat bands on partial line graphs SHIN MIYAHARA, Aoyama Gakuin University, KENN KUBO, HIROSHI ONO, YOSHIHIRO SHIMOMURA, NOBUO FURUKAWA — We introduce a systematic method to construct a lattice structure partial line graph. In the tight binding models on the partial line graphs, a flat band emerges on all over k-space. This method can be applied to any two- and three-dimensional systems. In addition to that, there is a large room to modify the lattice as the tight binding model on it has a flat band, i.e. we have many degrees of parameters, for examples, the on-site energy and the hopping amplitudes. We show several examples of the partial line graphs. It is expected that our method is also useful in giving a guide line for synthesizing materials with flat bands.

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