

We discuss the spectra of periodic Schrödinger operators on a metric graph corresponding to a variant graphene with bump boundaries. In the talk, we introduce two spectral discriminants for the quantum graph. Furthermore, we see pictures of dispersion relations and compare main results with results for ordinary (zigzag) boundaries. A crucial key of our spectral analysis is the elementary tool in the Linear algebra: the Cramer's rule. The slide of the talk will be uploaded on November 30th to the following webpage:

<https://www.maebashi-it.ac.jp/~niikuni/slide/20211201.pdf>