For the hexagonal lattice case, each mesh element is connected to six other mesh elements. Two of the connections are in purely the x-direction, while the other four contain both x and y components. Knowing the angle between connection branches to be 60 degrees, the x and y components of each connection are determined trigonometrically. Once again expressing the Laplacian in terms of second order central finite differences, we have for the hexagonal lattice:

This simplifies as follows:

The periodic boundary conditions in this case apply either to the x or y term depending on the interaction being considered.

if we have an regular hexagonal lattice, then will define *a* = *dx* = *dy*. Then the above equation simplifies to: