

GW and BSE methods

Jinyuan Wu

November 4, 2022

1 Overview of GW

1.1 Deriving formulas

2 Accuracy of GW

2.1 On so-called failure of GW

Some (weak-correlated, of course) materials are claimed to be impossible to be characterized correctly using GW , or at least G^0W^0 . [\[1\]](#) refutes such a claim, at least for ZnO.

References

- [1] Bi-Ching Shih, Yu Xue, Peihong Zhang, Marvin L Cohen, and Steven G Louie. Quasiparticle band gap of zno: High accuracy from the conventional G^0W^0 approach. *Physical review letters*, 105(14):146401, 2010.