Check 1：

Check 2:

Check 3:

# Check [[e^(-ikr\_μ ) δ\_μν ] H^P (k)[e^(ikr\_μ ) δ\_μν ]]\_μν=h\_μν^S (k)=e^(-ikr\_μ ) h\_μν^P (k) e^(ikr\_ν )

# hs\_uv == e-ikru eikrv hp\_uv

dhtt = 0

for iSym in range(NumSym):

for iKpt in range(NumKpt):

for iStt in range(NumStt):

for jStt in range(NumStt):

hp\_ij = HmtSymKpt0[iSym,iKpt,iStt,jStt]

hs\_ij = HmtSymKpt[iSym,iKpt,iStt,jStt]

iAt = Stt2AtOrb[iStt,0]

jAt = Stt2AtOrb[jStt,0]

dh = hs\_ij - hp\_ij \* np.exp(1j\*pi2\*KptLvRand[iKpt]@(AtLv[jAt-1]-AtLv[iAt-1]))

dhtt += abs(dh)

print(dhtt)

# Check d\_μν^0=δ\_(i,gj) ⟨α│g│β⟩

ddtt = 0

for iSym in range(NumSym):

for uStt in range(NumStt):

for vStt in range(NumStt):

duv = Dg[iSym,uStt,vStt]

iAt, iOrb = Stt2AtOrb[uStt]

jAt, jOrb = Stt2AtOrb[vStt]

dt\_i\_gj = 1 if SymAt0[iSym,jAt-1,-1] == iAt else 0

g\_ab = SymSPDF[iSym,iOrb,jOrb]

dd = duv - dt\_i\_gj \* g\_ab

if dt\_i\_gj == 0 and duv != 0:

print(iSym,uStt,vStt)

if dt\_i\_gj\*g\_ab != 0 and duv == 0:

print(iSym,uStt,vStt)

# if dt\_i\_gj:

# print(duv,dt\_i\_gj \* g\_ab)

ddtt += abs(dd)

print(ddtt)