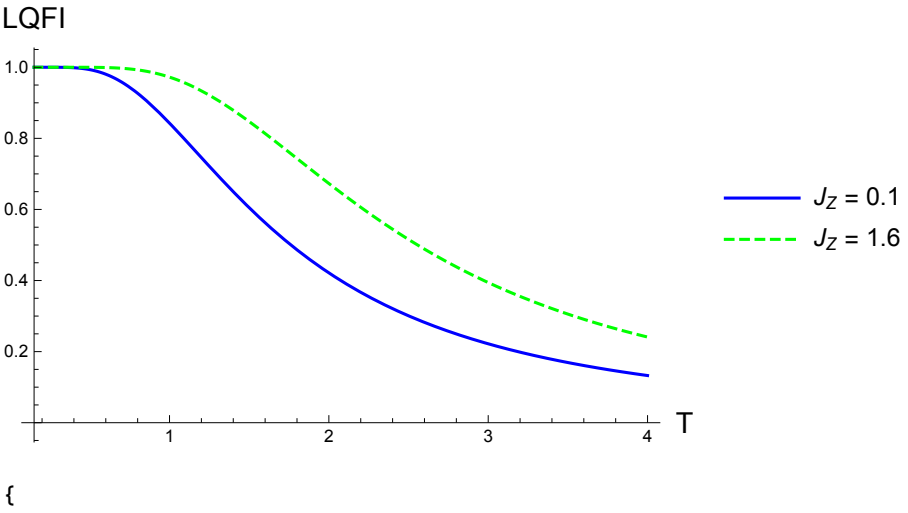
```
GroundState[mat_?HermitianMatrixQ] := Module[{gr, u, e, m, len, pos},
  e = Eigenvalues[mat];
  m = Min[e];
  pos = Position[e, m] // Flatten;
  u = Eigenvectors[mat];
  gr = Mean[Table[Outer[Times, u[[i]], u[[i]]], {i, pos}]];
  Return[gr]
 ]


gts::warn =
  "to avoid overflow  for  temparature `1`  ground state is calculated instead .";
ThermalState[rho_, t_, chop_: 10^-8] /; If[Chop[t, chop] ≠ 0, True, Message[gts::warn, t];
   True] := Module[{ther},
  ther =
   If[Chop[t, chop] == 0, GroundState[rho], MatrixExp[- rho / t] / Tr[MatrixExp[- rho / t]]];
  Return[ther]
 ]
(*not ≠ in if massage while it is = inside if function *)



HeisenbergXYZ[jx_, jy_, jz_, dz_] :=
 jx * KroneckerProduct[PauliMatrix[1], PauliMatrix[1]] +
  jy * KroneckerProduct[PauliMatrix[2], PauliMatrix[2]] +
  jz * KroneckerProduct[PauliMatrix[3], PauliMatrix[3]] +
  dz * KroneckerProduct[PauliMatrix[1], PauliMatrix[2]] -
  dz * KroneckerProduct[PauliMatrix[2], PauliMatrix[1]]

localFisher[jx_, jy_, jz_, dz_, t_] := Block[{λ, W},

  λ = Eigenvalues[ThermalState[HeisenbergXYZ[jx, jy, jz, dz], t] // N];
  W[i_, j_] := Sum[ (1 - KroneckerDelta[m, n]) *
      (2 λ[[m]] * λ[[n]]) / (λ[[m]] + λ[[n]]) KMatrix[i][[m, n]] * KMatrix[j][[n, m]], {n, 4}, {m, 4}];
  Return[1 - Max[Table[W[i, i], {i, 3}]]]]
```

In[93]:=
```
Plot[{localFisher[-1, -.5, .1, 1, t], localFisher[-1, -.5, 1.6, 1, t]}, {t, .15, 4},
 PlotStyle → {{Blue}, {Green, Dashed}}, PlotLegends → {"Jz = 0.1", "Jz = 1.6"},
 AxesLabel → {Style["T", Black, FontSize → 15], Style["LQFI", Black, FontSize → 15]}]
```

Out[93]=



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