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Mott-Hubbard metal-insulator transition in $d = \infty$

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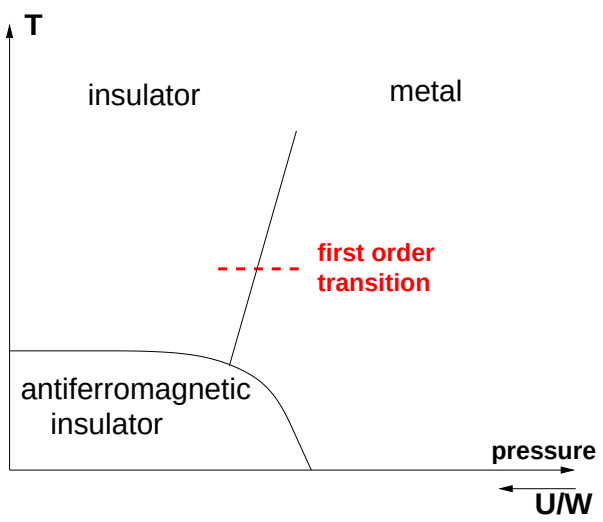
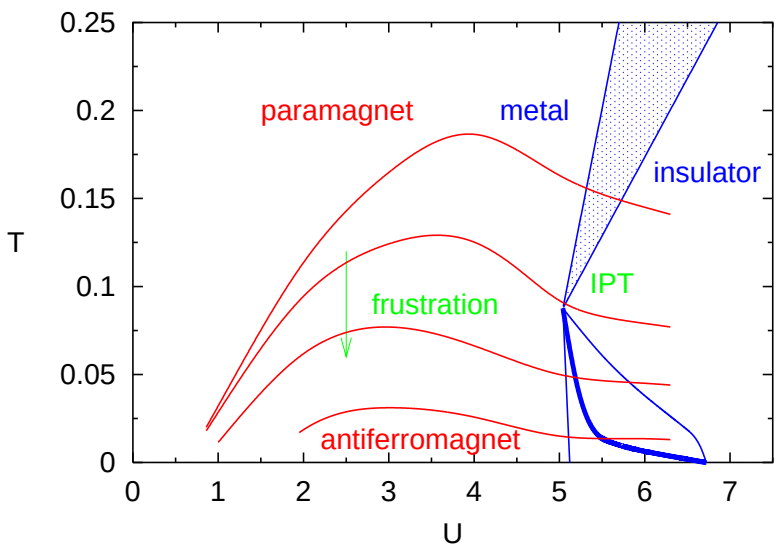
Motivation: V_2O_3



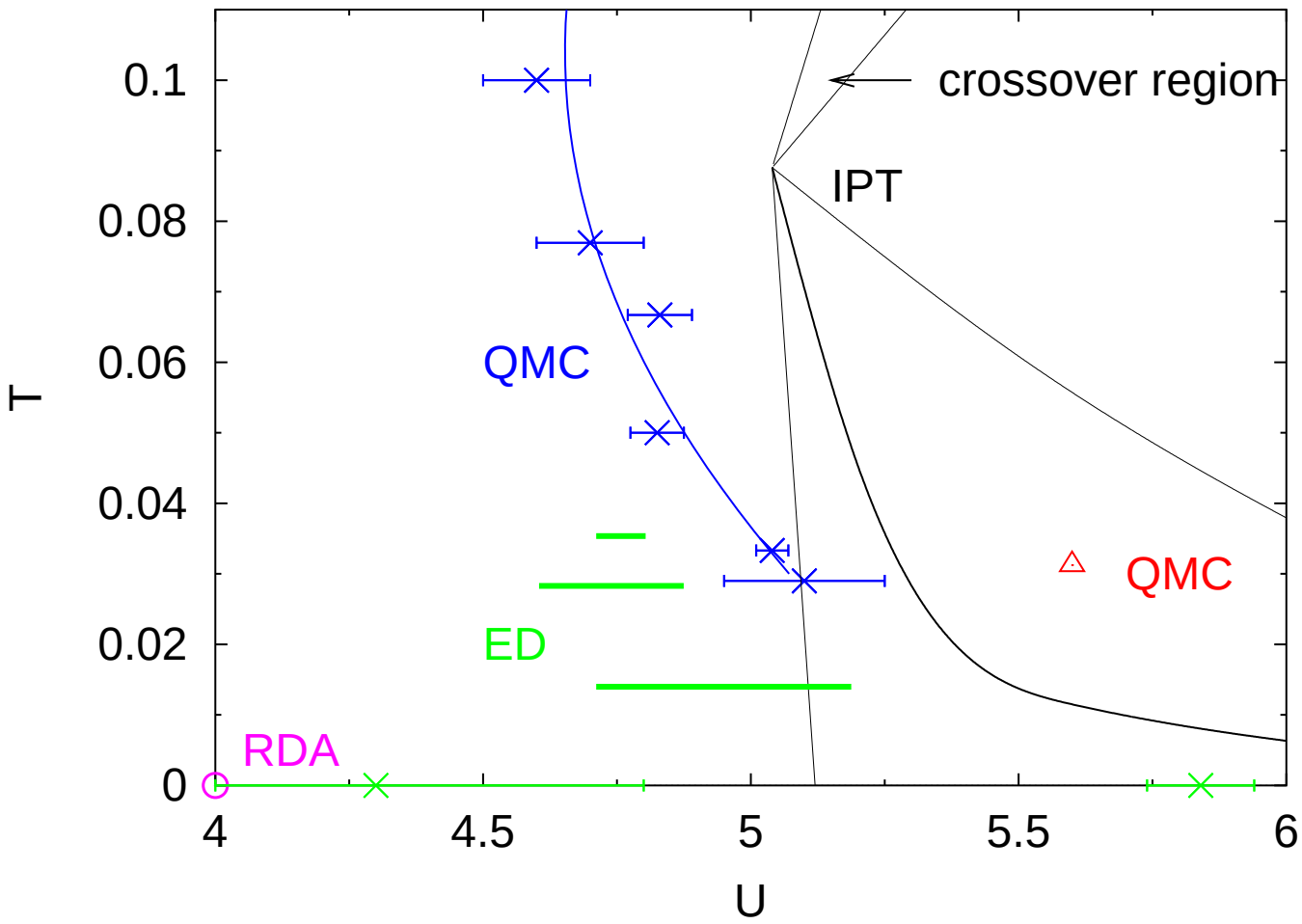
1-band Hubbard model



Aim: Phase diagram / order of phase transition for

- frustrated 1-band Hubbard model at half filling
- Dynamical Mean-Field Theory (DMFT)
- semielliptic Bethe density of states ($W = 4$)

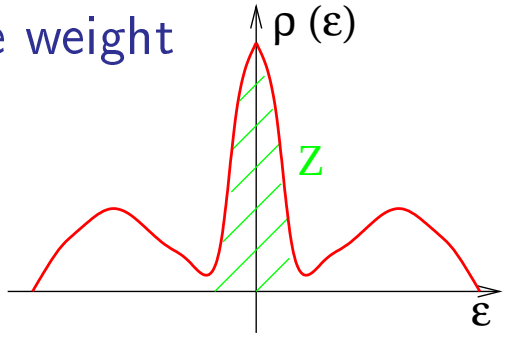
Status of phase diagram in spring 1999

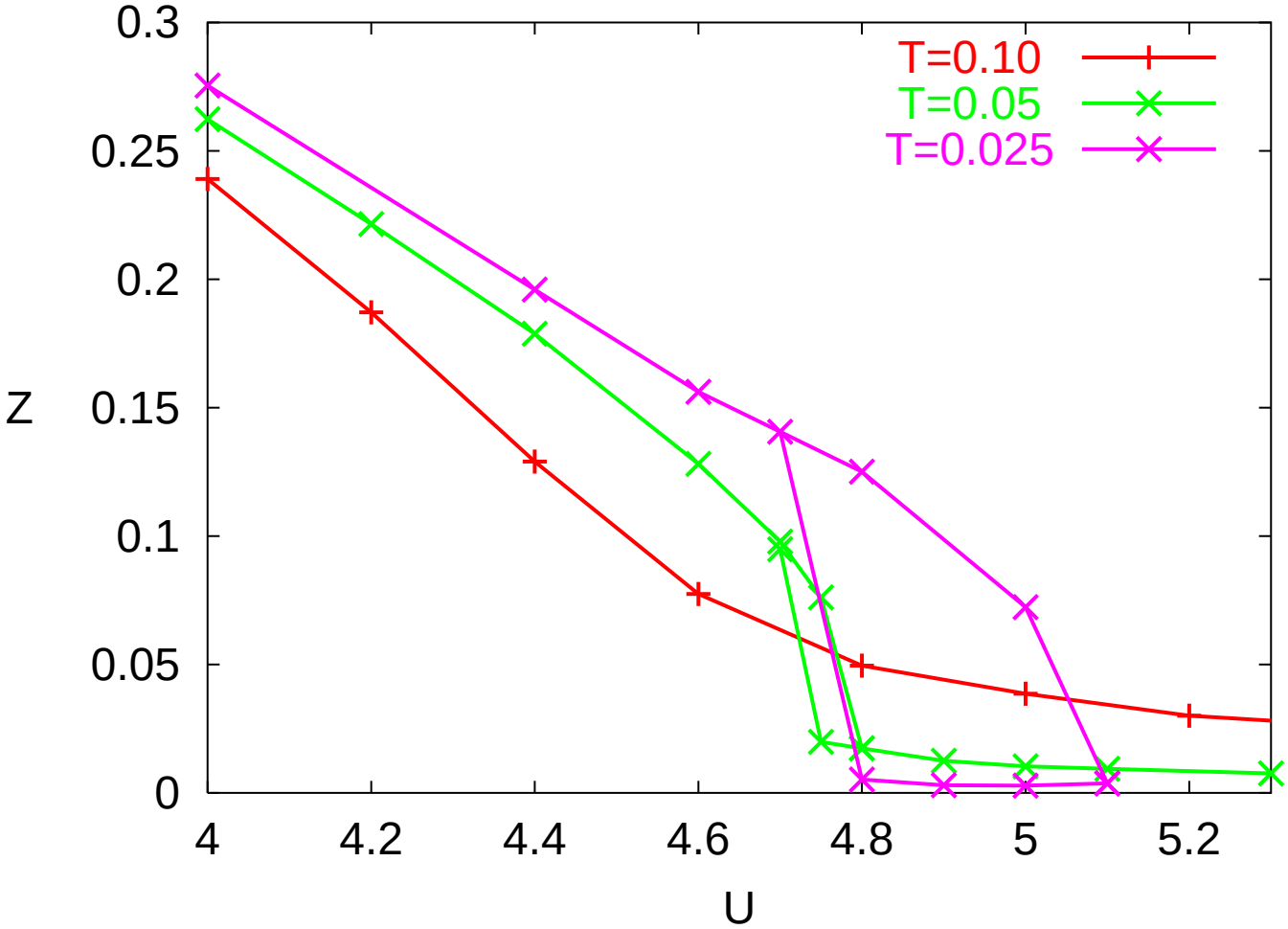


Georges et al. (1996)
Rozenberg, Kotliar, and Zhang (1994)
Noack and Gebhard (1999)
Georges et al (1996); Hofstetter
Schlipf et al (1999)

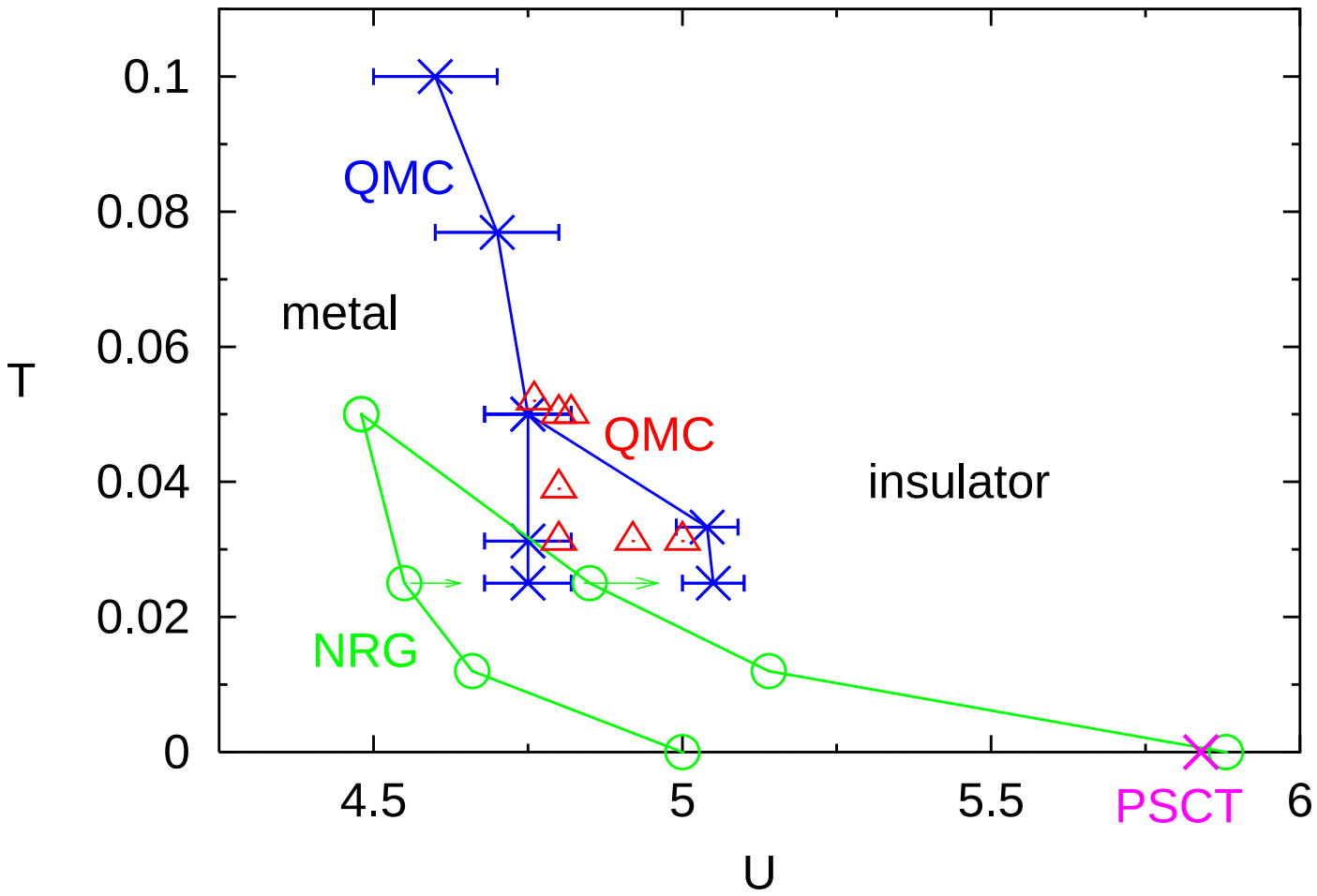
Results: quasiparticle weight

$$Z = \frac{m}{m^*} = \left(1 - \frac{\partial Re\Sigma(\omega)}{\partial \omega}\right)^{-1}$$





Phase diagram of 1-band Hubbard model ($n = 1$)



Rozenberg, Chitra and Kotliar (1999)
Moeller et al. (1996)

Conclusions

- results from fundamentally different methods now converge towards a reliable phase diagram
- coexistence region at low T $\longrightarrow$ first order transition

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