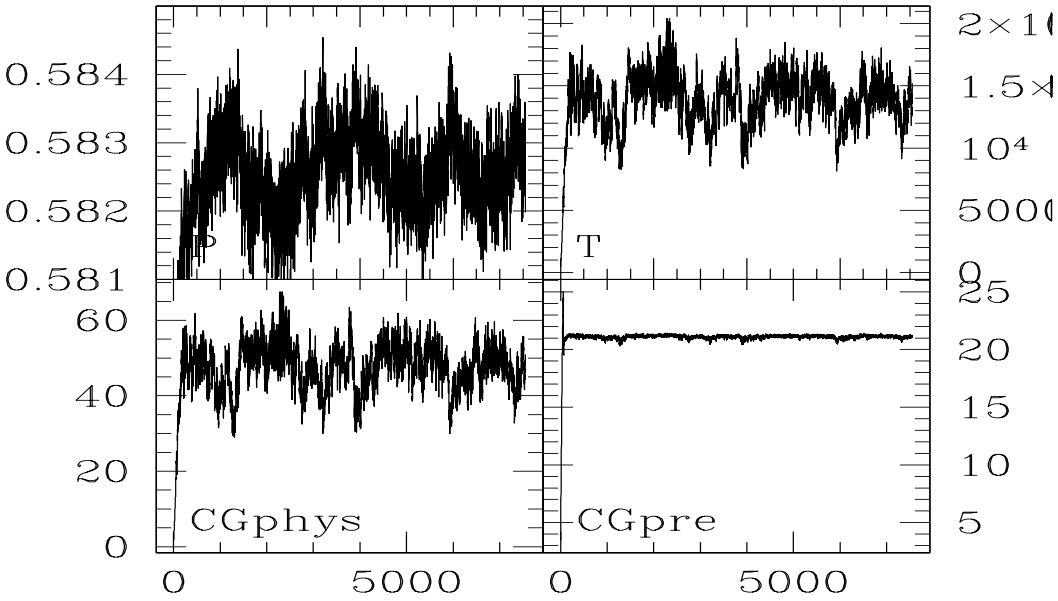
Experiments with twisted mass fermions in the ϵ-regime

- **ϵ-regime: region of chiral symmetry restauration**
- **$\Rightarrow$ no problem with phase transition**
- **$\Rightarrow$ need only small lattices, $L \approx 1.5$fm**
- **need: $(FL)^2 < 1$**
- **Fitting Formulae for correlattion functions:**
  - available from chiral perturbation theory
  - summed over topological sectors
- **Eigenvalues: overlap on twisted mass sea?**

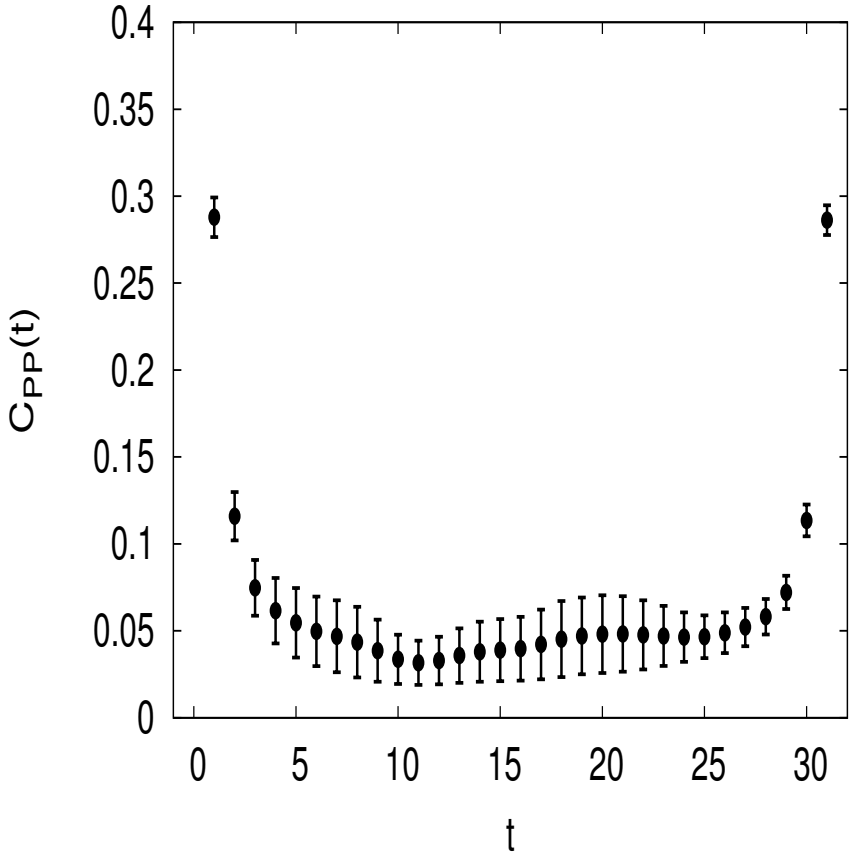
Monte Carlo time evolution of plaquette

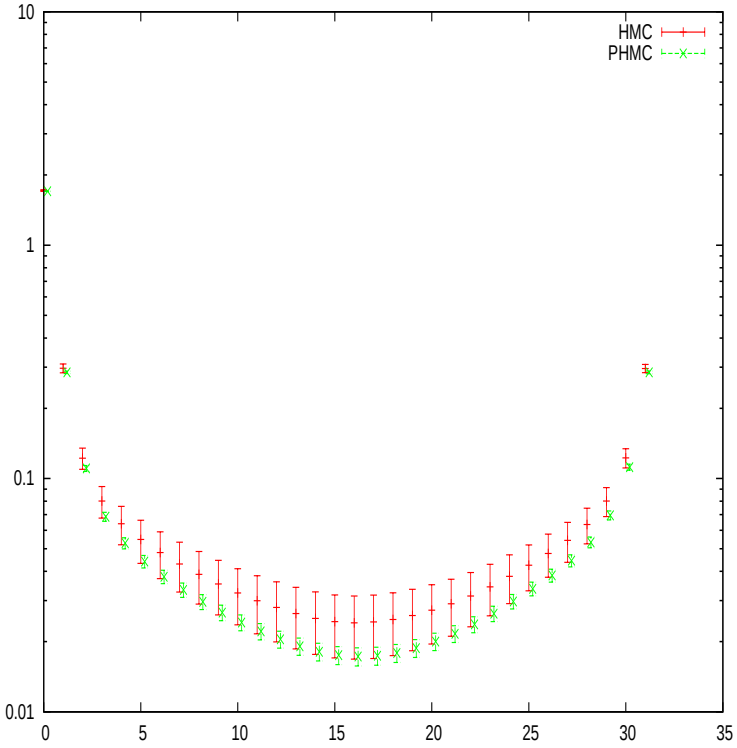
Simulations: $\beta = 3.9$, $\kappa = \kappa_{\text{crit}}(\mu = 0.004)$, $\mu = 0.0005$

lattice size: $16^3 \cdot 32$ $(F \approx 0.07)$



PP correlator





standard correlation function

low mode averaged

→ large errors from essentially *one* configuration

fake PHMC-algorithm simulation

next step: real PHMC simulation