

# The $SU(N)$ phase diagram

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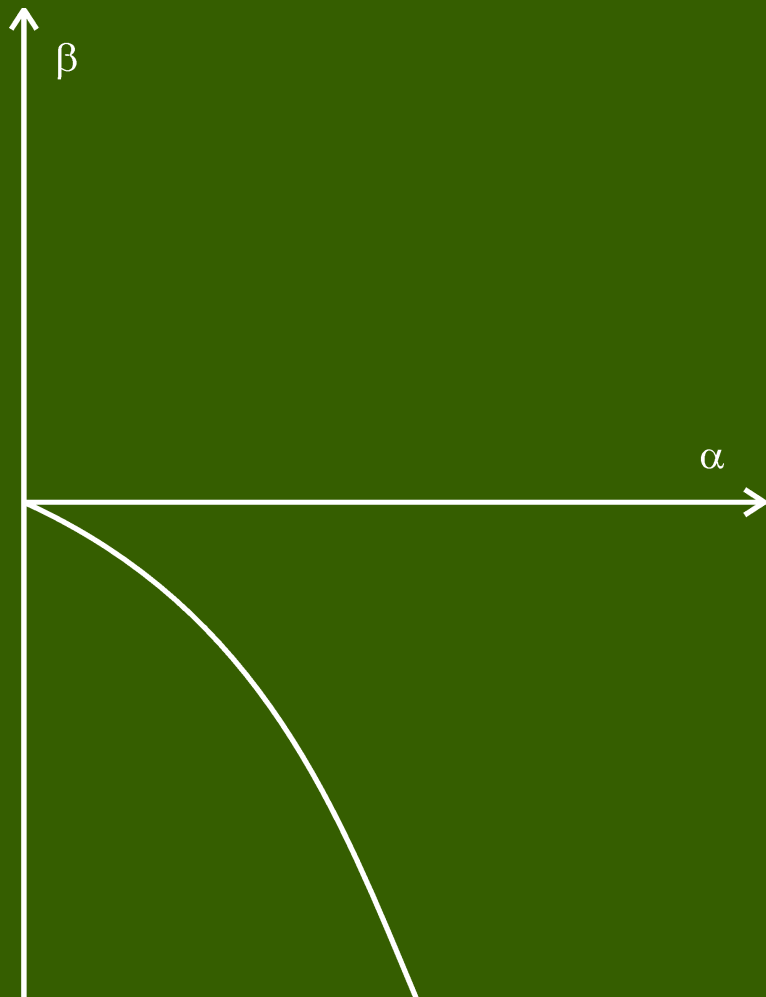


# The $SU(N)$ phase diagram

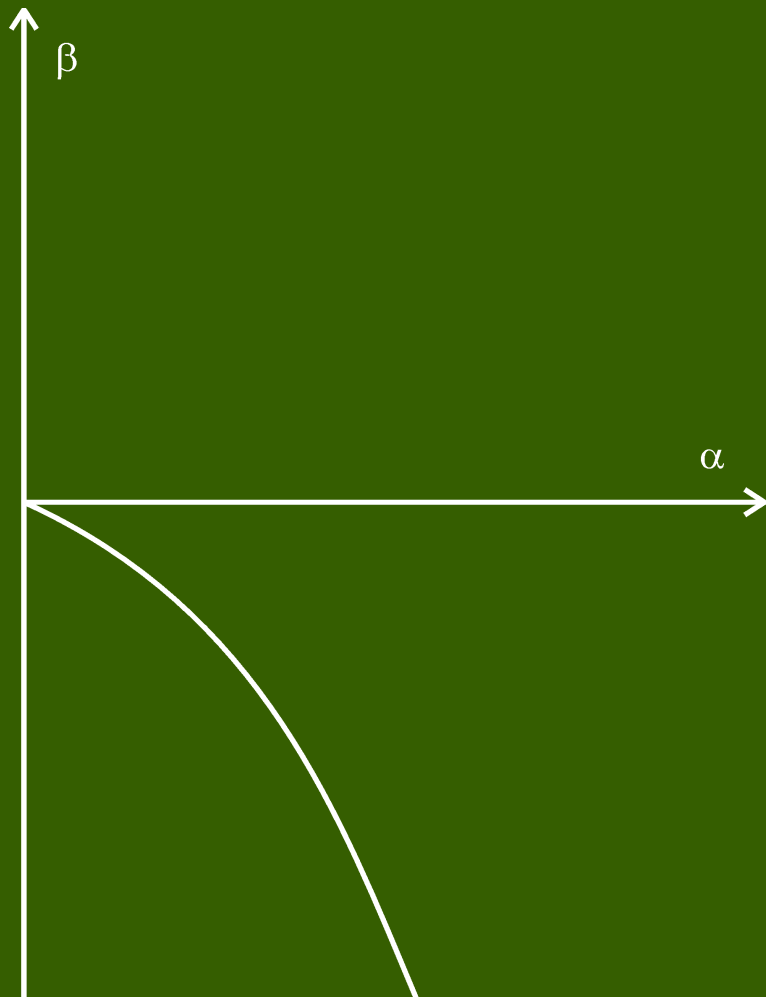
... in the  $N_c - N_f$  plane

- > Introduction: the phases
- > Phase diagram
- > Comparison to  $N=1$  SUSY
- > Application
- > Outlook: Lattice
- > Summary

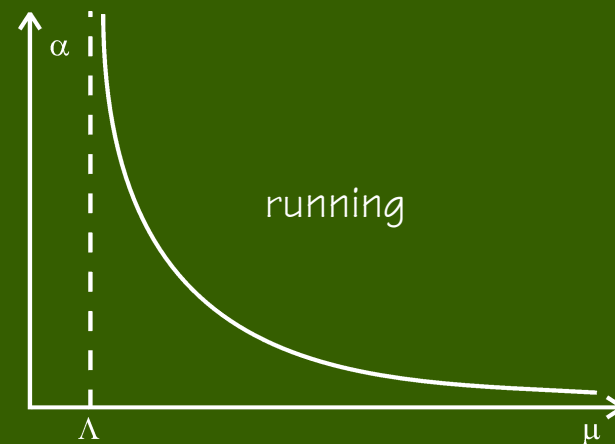
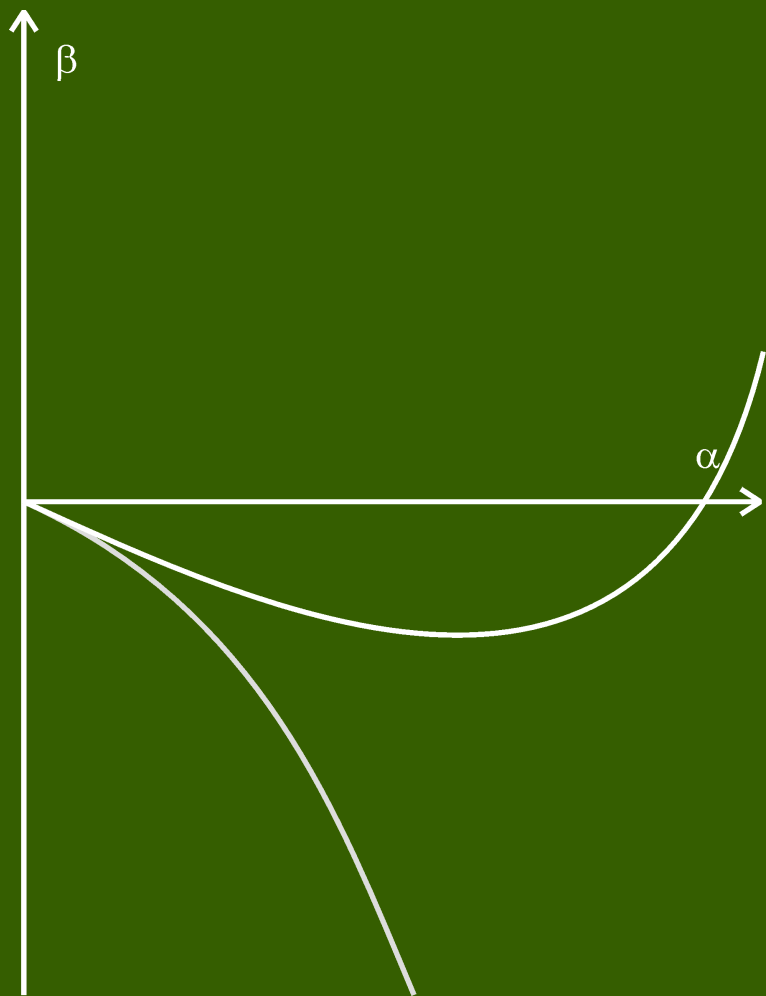
# Beta function



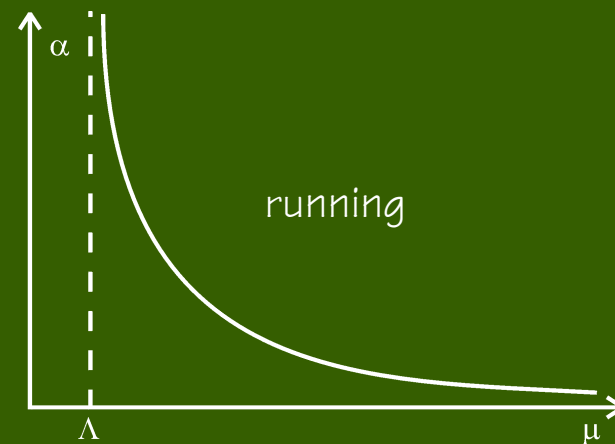
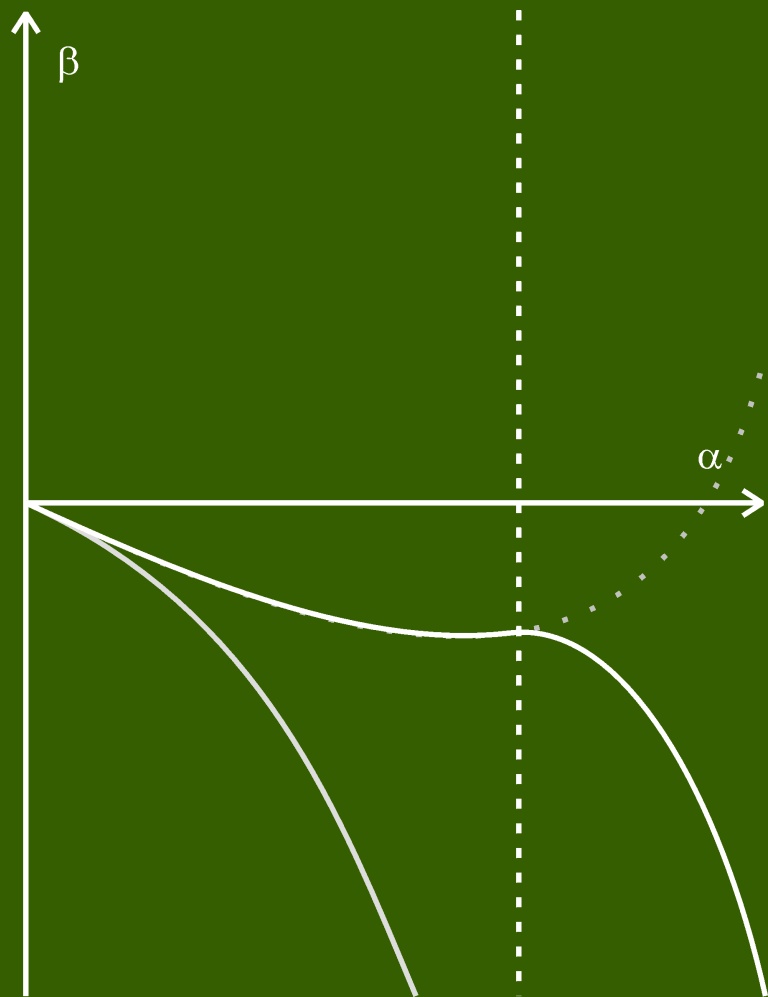
# Beta function



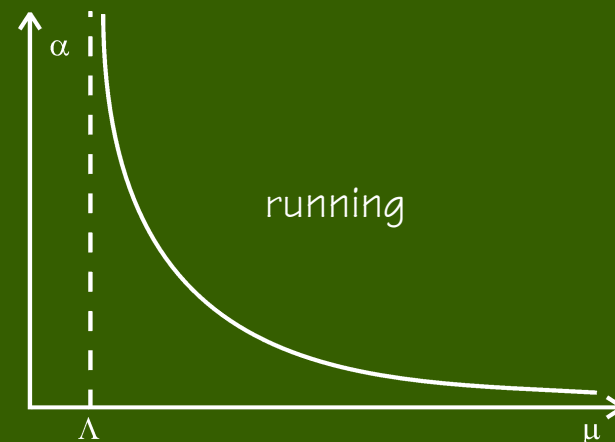
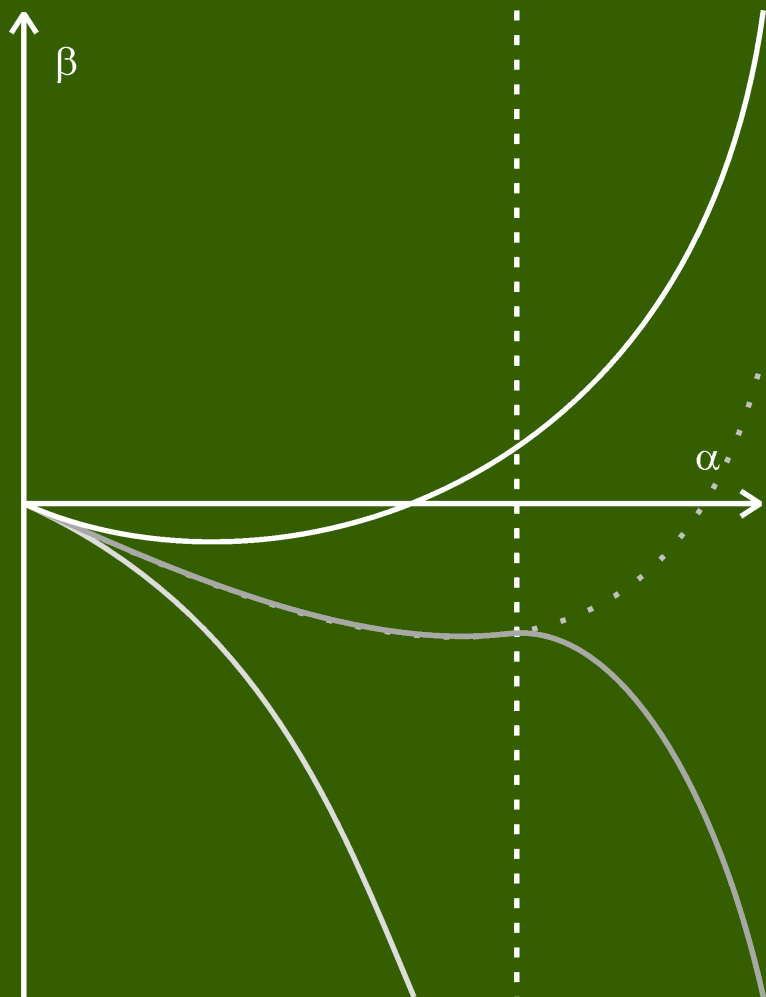
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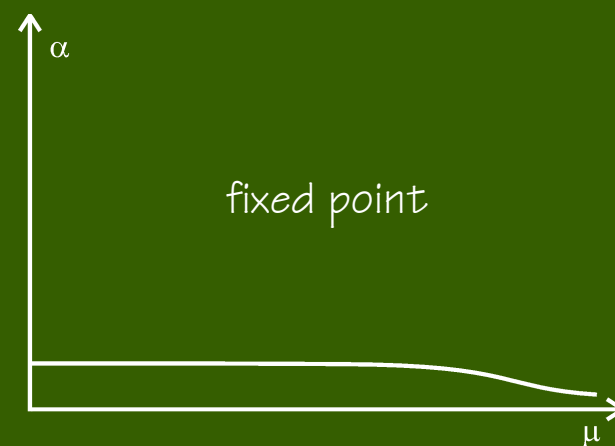
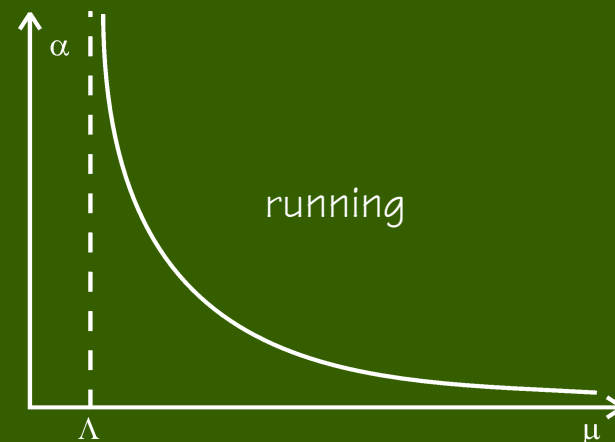
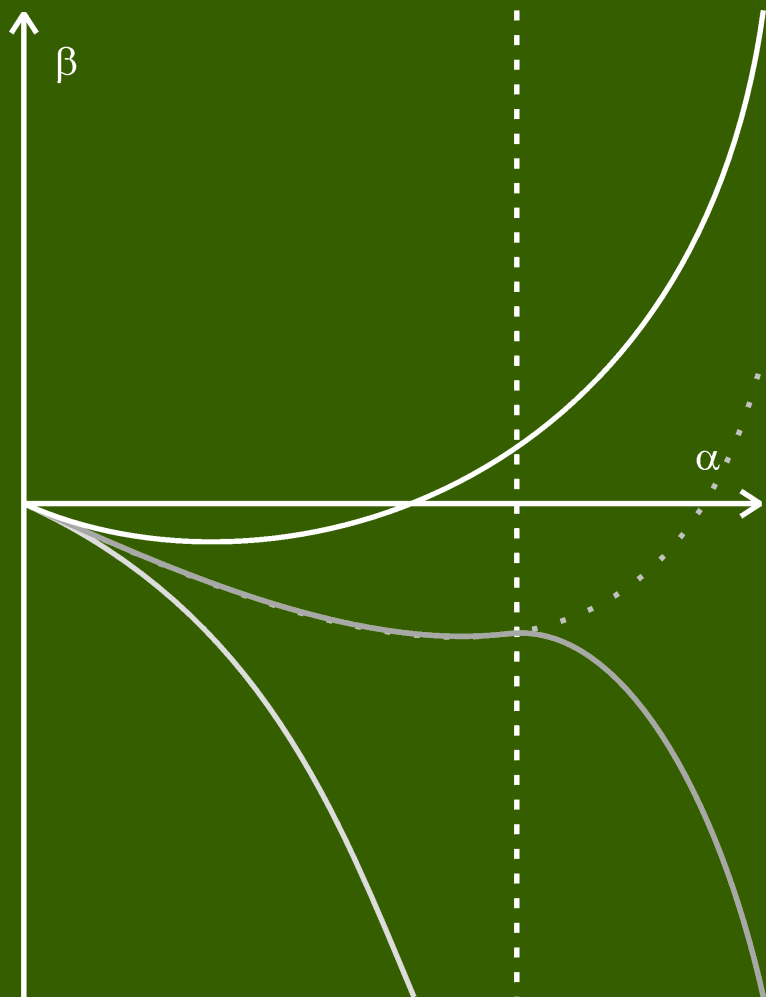
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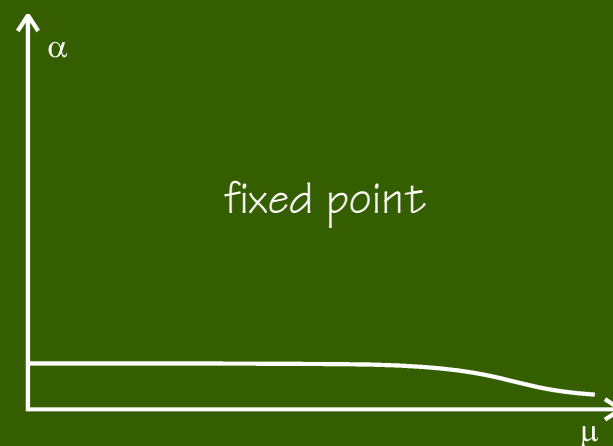
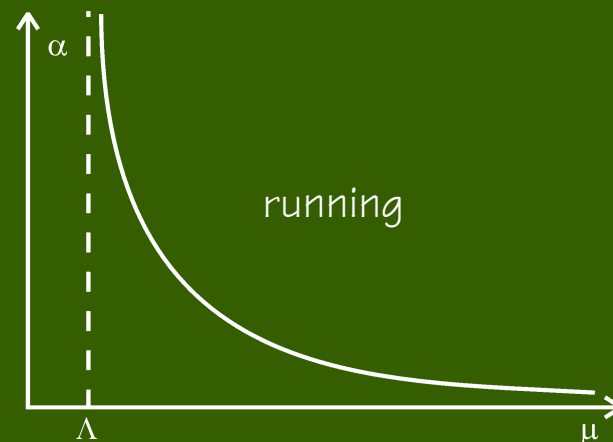
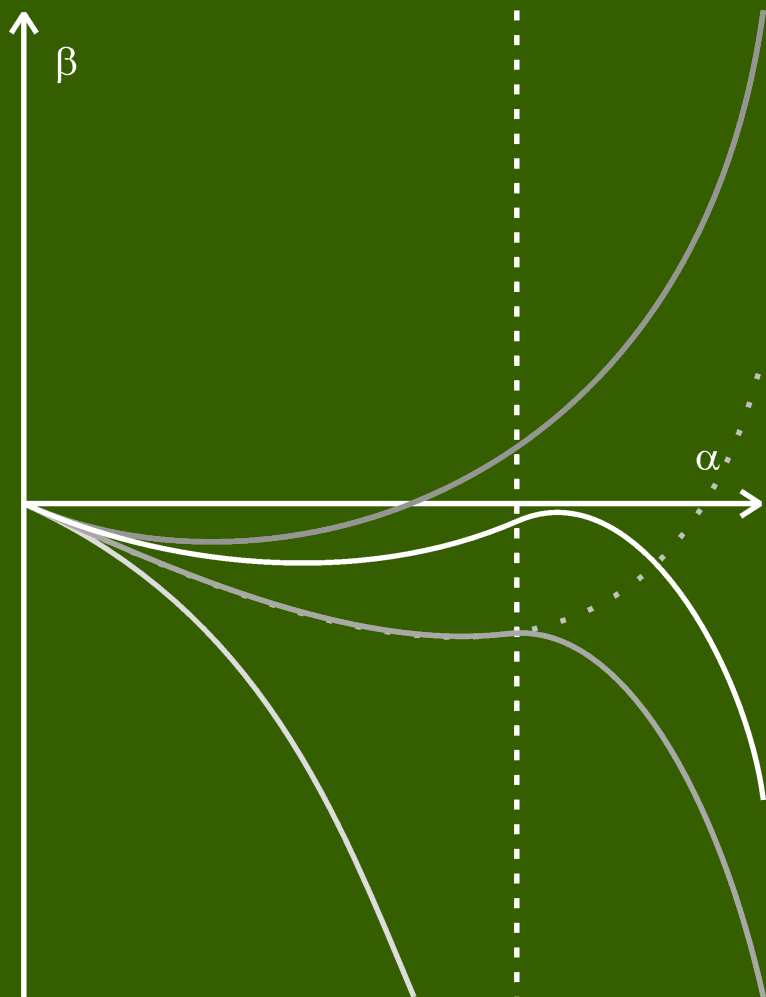


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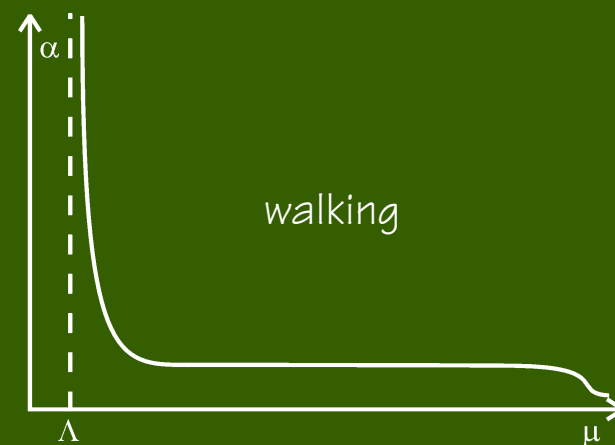
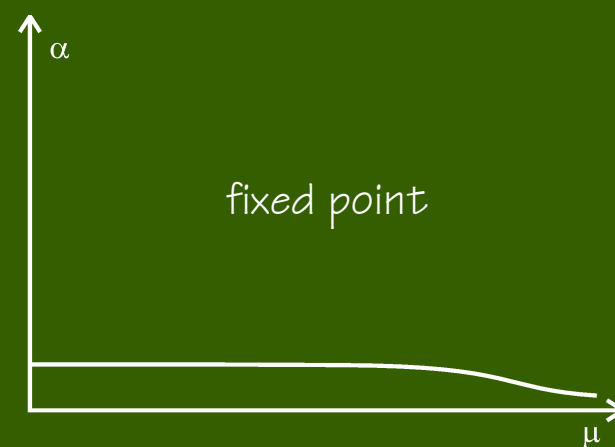
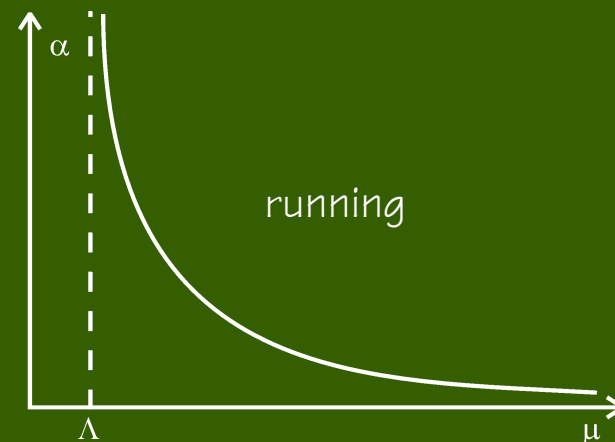
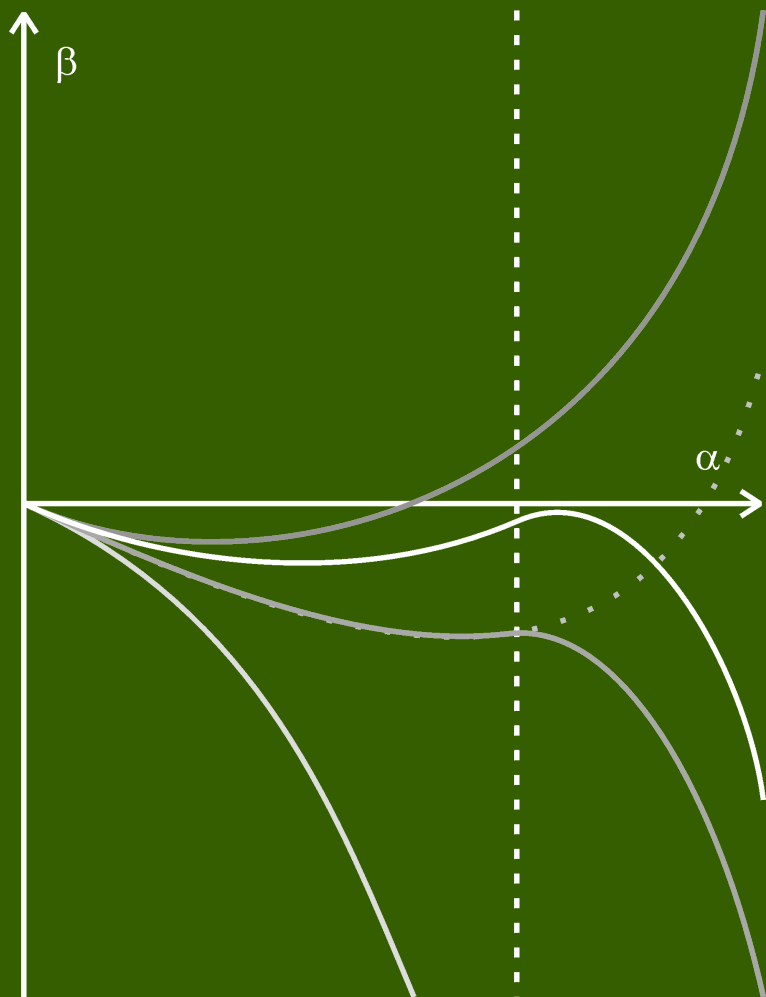




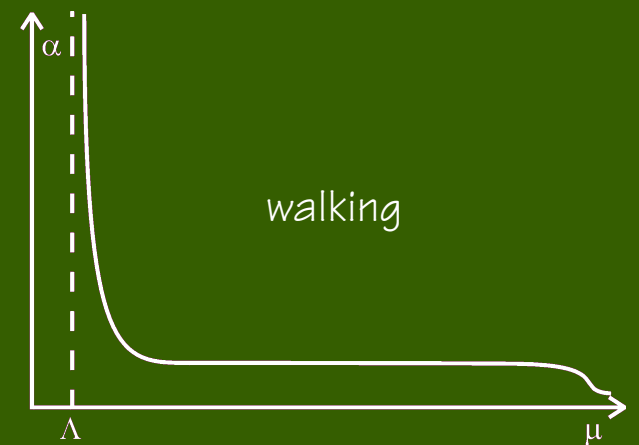
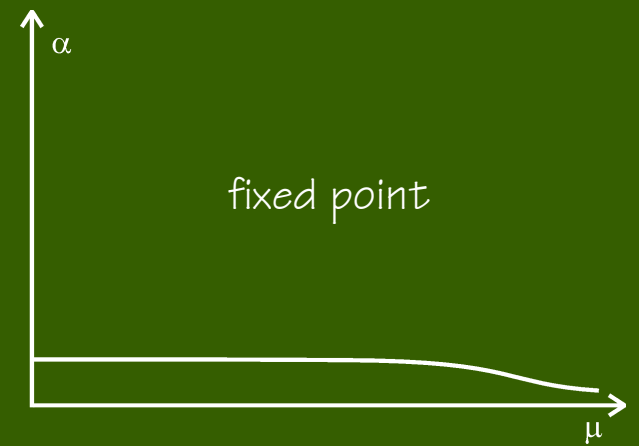
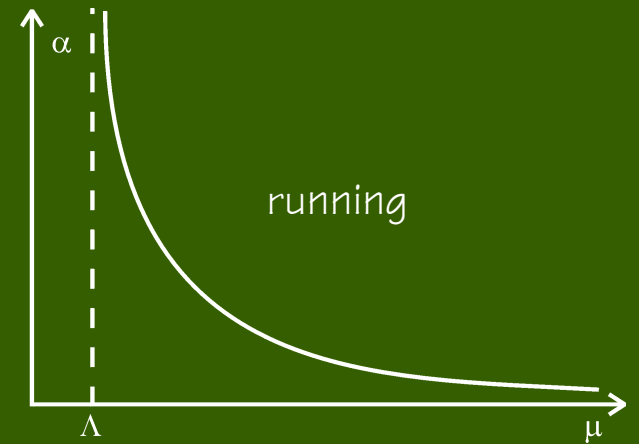
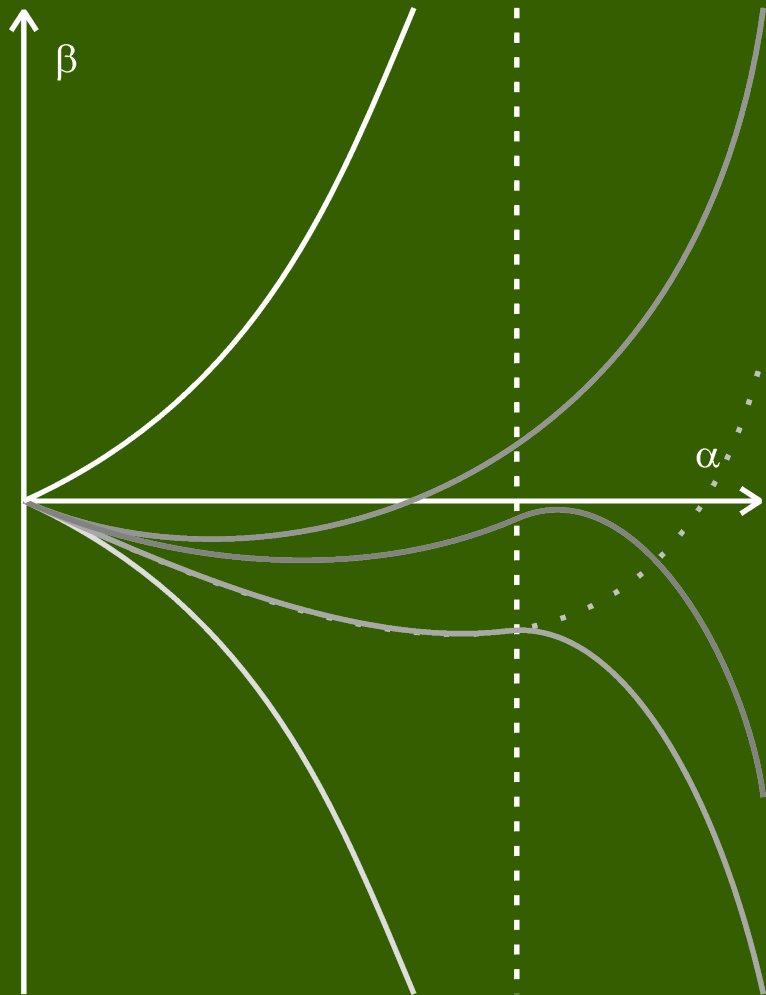
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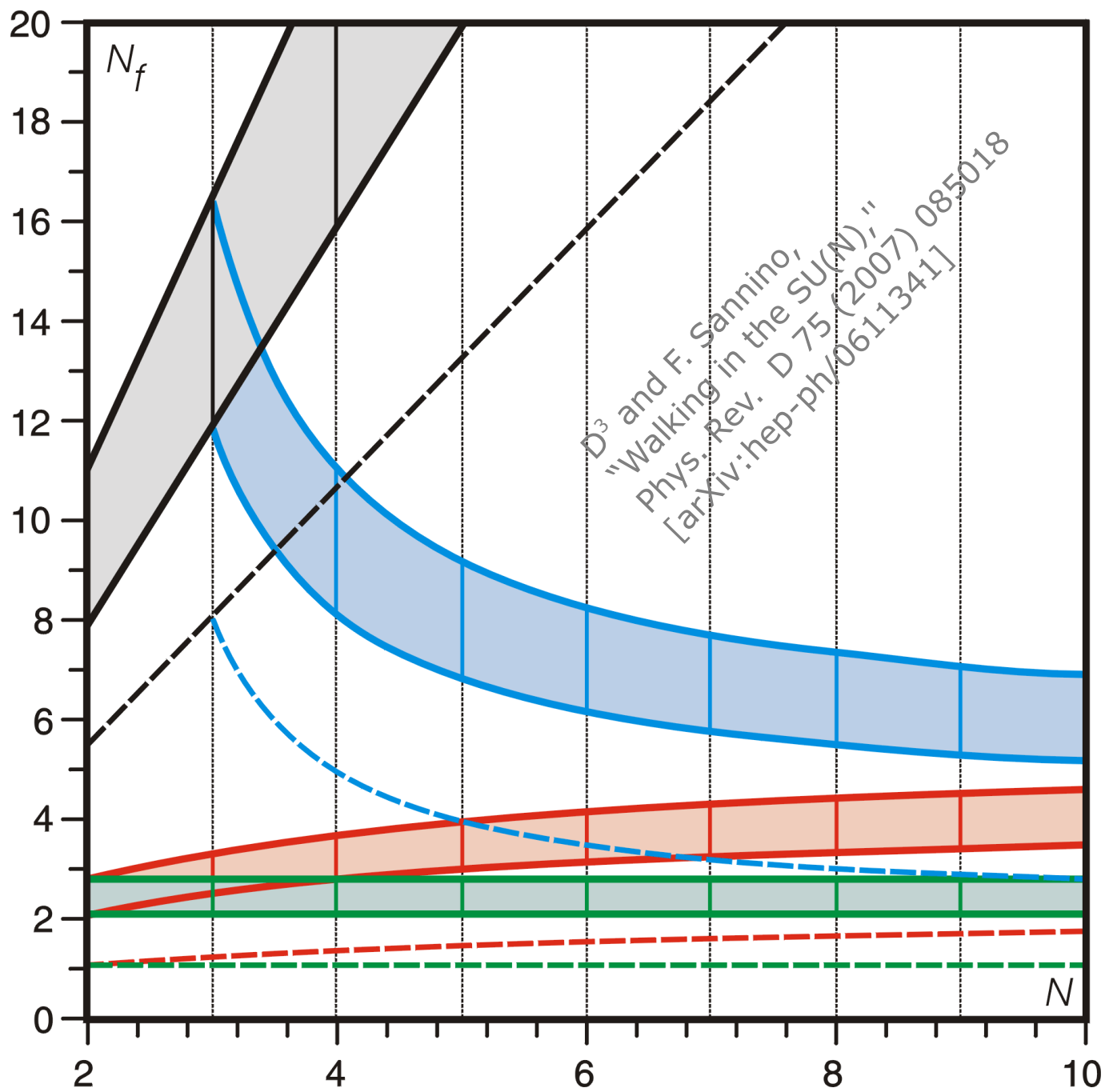


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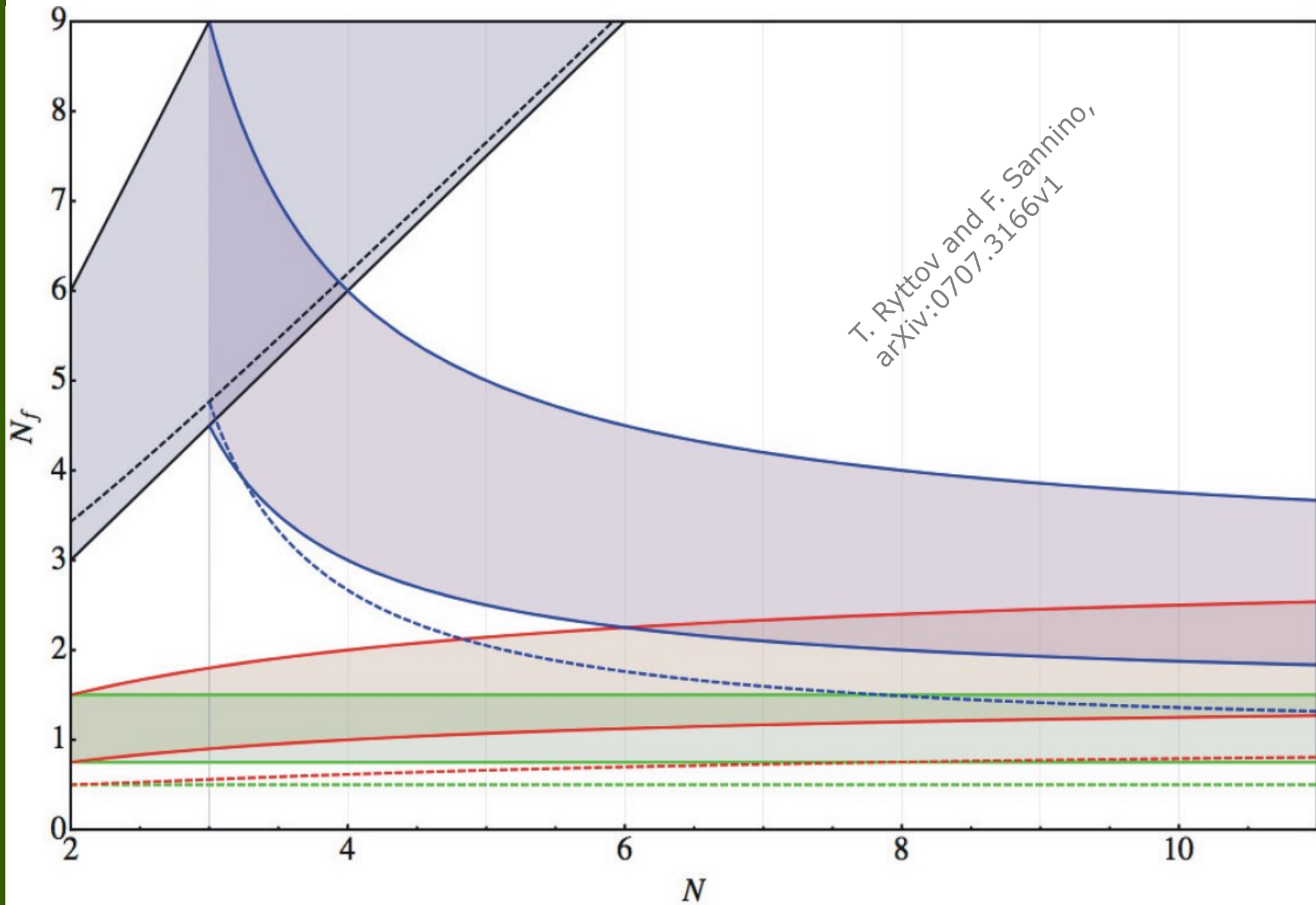




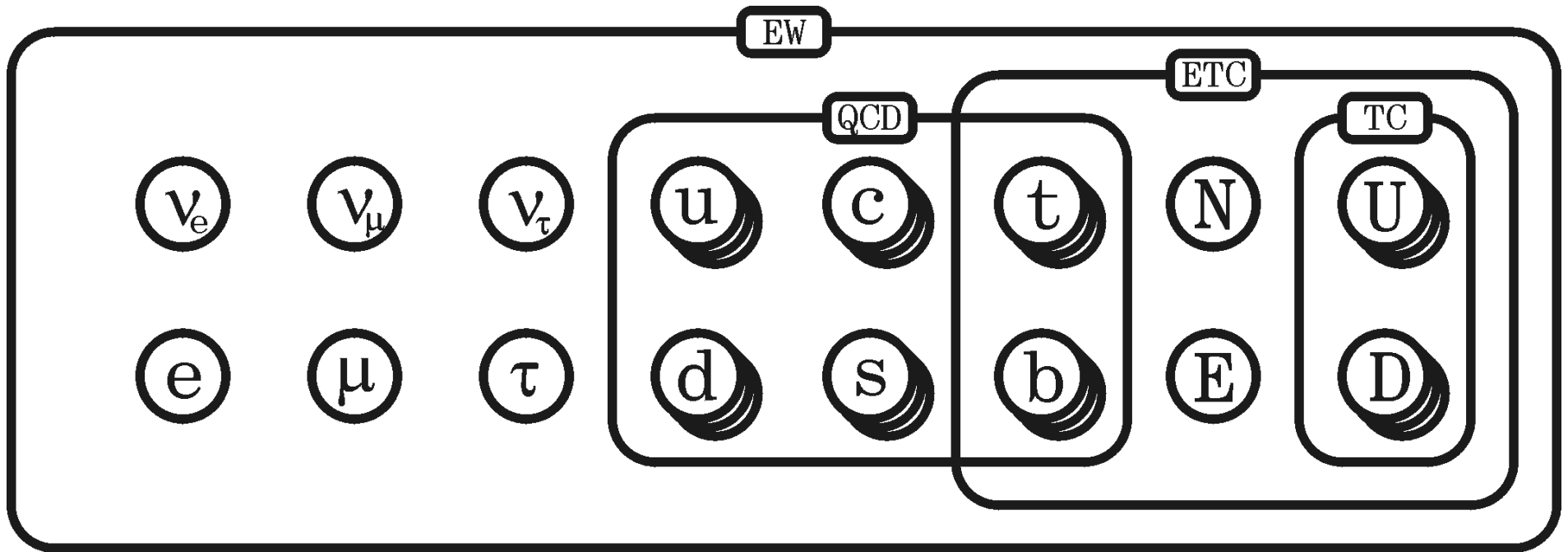


Atlas sive Cosmographicae meditationes de fabrica mundi et fabricati figura. Dvisburgi Clivorum [1595]

[http://commons.wikimedia.org/wiki/Image:Mercator\\_Africa\\_037.jpg](http://commons.wikimedia.org/wiki/Image:Mercator_Africa_037.jpg)



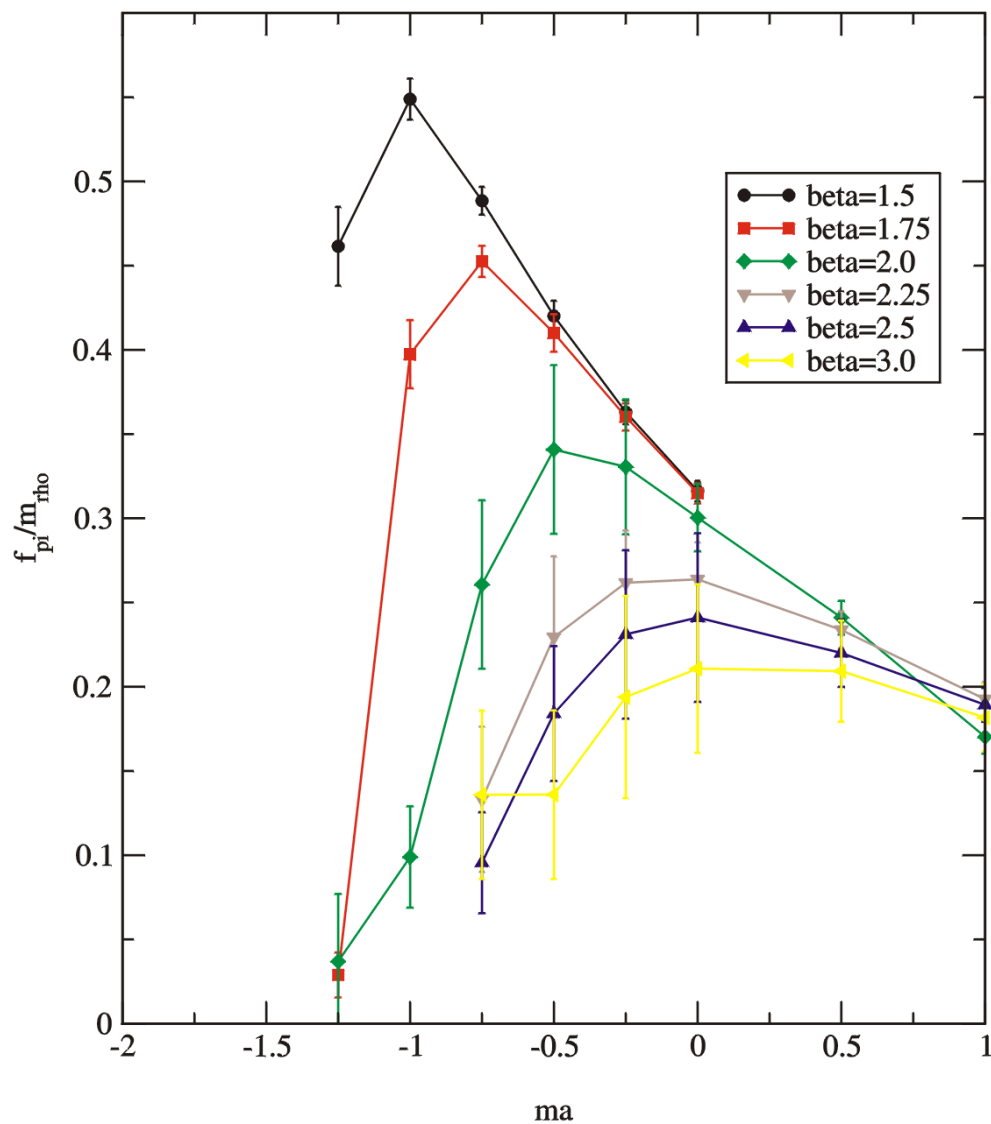
T. Rytto and F. Sannino,  
arXiv:0707.3166v1



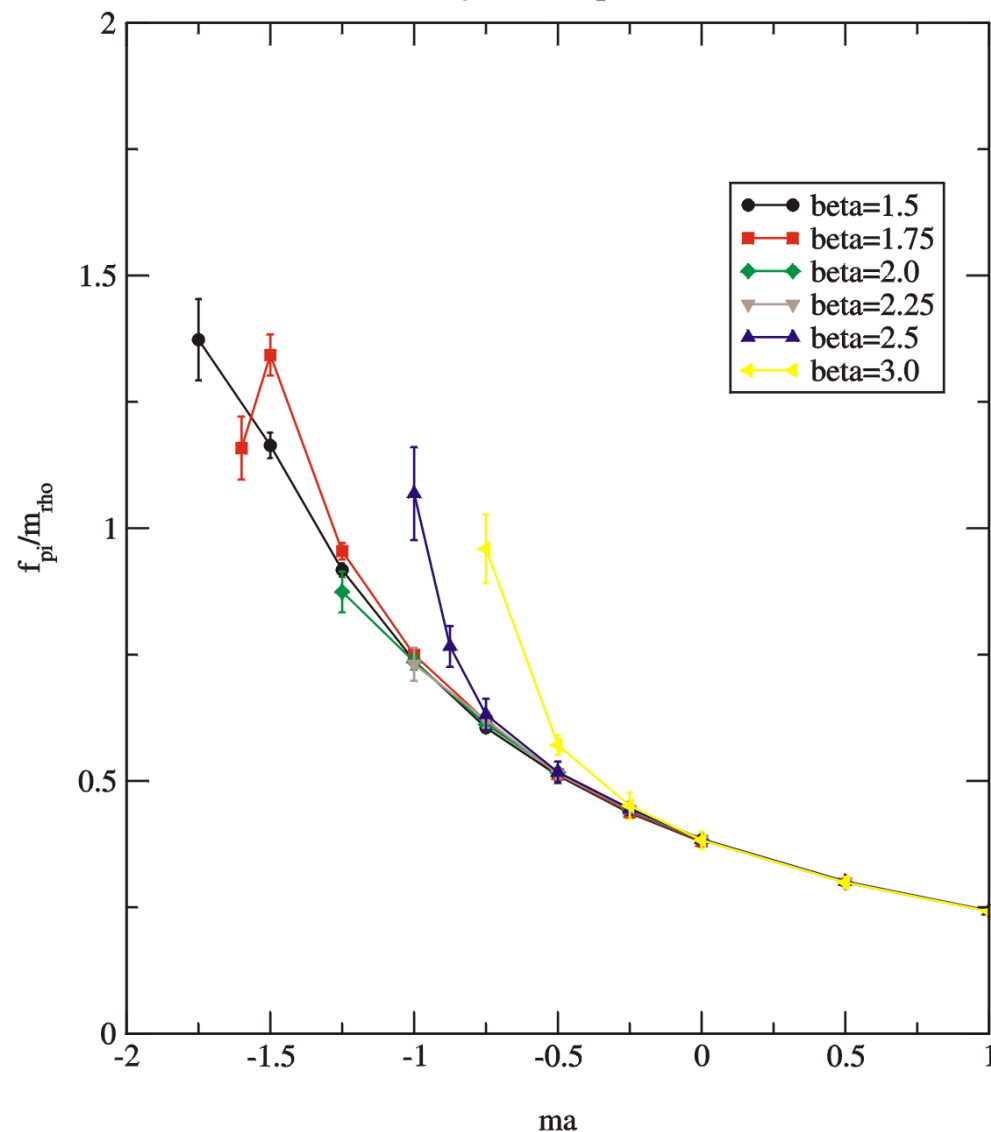
# Dynamical Electroweak Symmetry Breaking

$D^3$ , F. Sannino and K. Tuominen,  
 Phys. Rev. D **72** (2005) 055001 [arXiv:hep-ph/0505059];  
 Phys. Rev. D **73** (2006) 037701 [arXiv:hep-ph/0510217].

fundamental quarks



Symmetric quarks



# Lattice calculations (preliminary)

S. Catterall and F. Sannino, arXiv:0705.1664 [heplat].



# The $SU(N)$ phase diagram

... in the  $N_c - N_f$  plane

- > presented phase diagram
- > ..., set into perspective with large  $N_c$  studies
- > comparison to phase diagram for  $N=1$  SUSY
- > pointed at use in dynamical EW symmetry breaking
- > displayed related lattice studies