

# Bootstrapping the long-range Ising model

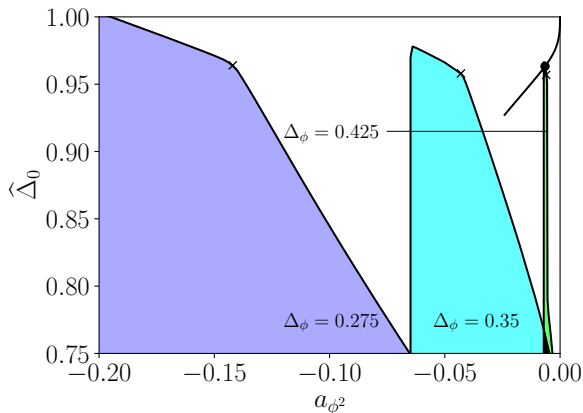
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Analytic results in CFT  
IPhT Saclay



## Numerical bootstrap in $p = 2$



**Figure:** Bound on spin-0 gap for different values of  $\Delta_\phi$ , and for spin-2 gap  $\hat{\Delta}_2 \geq 2.4 - 2.2$  from narrow to wide resp. for aesthetic reasons.

## Numerical bootstrap in $p = 2$

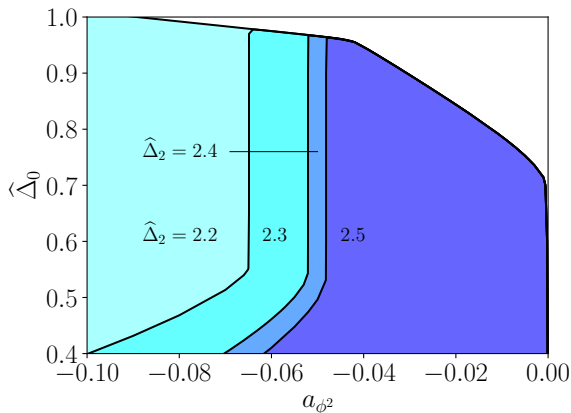
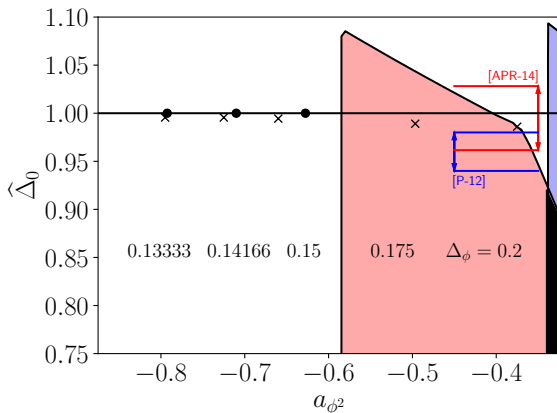


Figure: Bounds on spin-0 gap for  $\Delta_{\phi} = 0.35$ , different gaps in spin-2 sector.

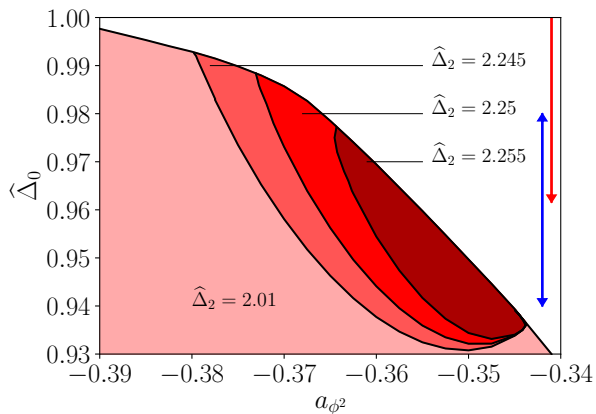
## Numerical bootstrap in $p = 2$

- Let us now compare with MC results [Picco,2012], [Angelini, Parisi, Ricci-Tersenghi,2014] and perturbation theory around short-range end.



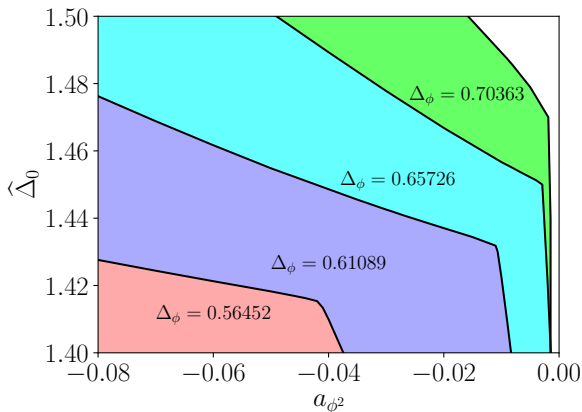
**Figure:** Kinks for different values of  $\Delta_\phi$ , dots are results from  $O(\delta)$  perturbation theory from short-range end. Colored subregion is for  $\Delta_\phi = 0.2$ .

## Numerical bootstrap in $p = 2$



**Figure:** Bounds on the spin-0 gap for  $\Delta_{\phi} = 0.2$  and different gaps on the spin-2 sector. We scan over the dimension of a single exchanged relevant scalar instead of maximizing the scalar gap. The blue and red error bars are MC results.

# Numerical bootstrap in 3d



**Figure:** Bound on spin-0 gap as a function of  $a_{\phi^2}$ ,  $p = 3$ . The colored regions represent different values of  $\Delta_\phi$ .