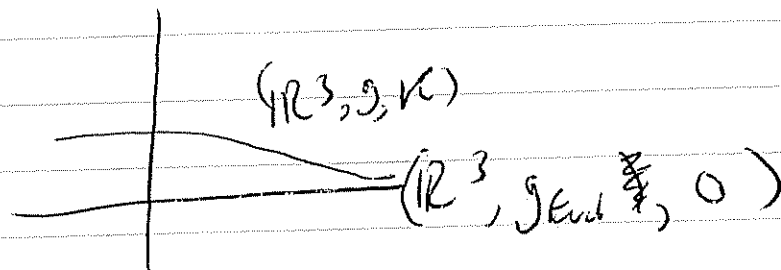


11 May 2007  
M. Anderson

Is AdS spacetime dynamically stable?

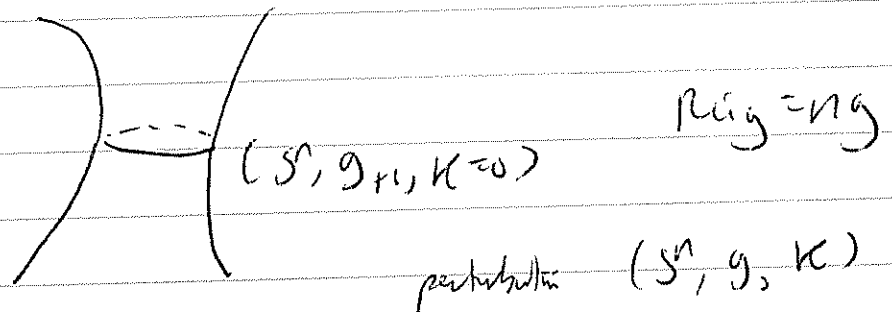
Minkowski:  $g = -dt^2 + \sum dx_i^2$   
 $Ric \equiv 0$



Christodoulou - Teegerman: Lindblad - Rademski all dimensions OK

de Sitter  $\Lambda > 0$  scalar  $> 0$

$$g^{n+1} = -dt^2 + \cosh^2 t g_{S^n(t)}$$



3+1: Friedrich

n+1 even: Anderson (2004)

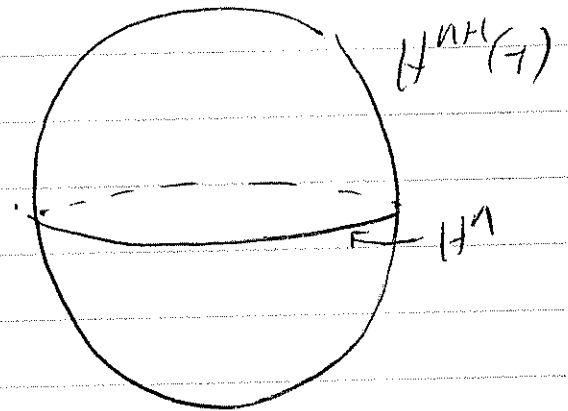
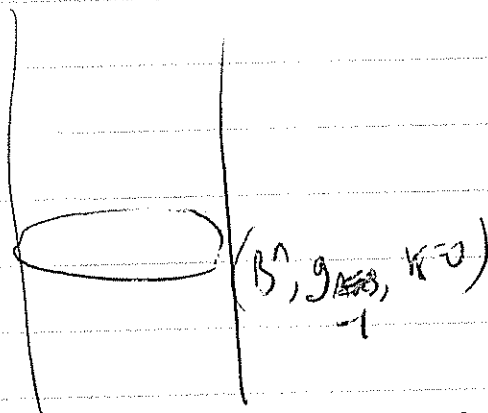
all n: Ringstrom (2006)

$\Delta u = 0, u|_{\partial} = f, N(g)$

Anti de Sitter  $\Lambda < 0$

$Ric g = -n g$

$g_{AdS} = -\cosh^2 r dt^2 + dr^2 + \sinh^2 r g_{S^{n-1}(r)}$   
 $H^{n-1}(-1)$



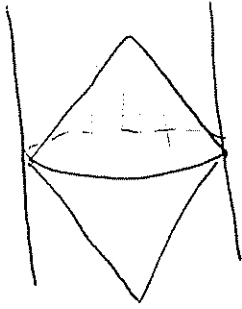
Conformal compactification



$-dt^2 + g_{S^{n-1}(1)}$   
Einstein cylinder

$\tilde{g}_{AdS}$   
"  
 $\frac{1}{\cosh^2 r} g_{AdS}$

LM



Initial boundary value problem

Q Let  $(B^n, g, K)$  be a small perturbation of pure AdS initial data with boundary data = Einstein cylinder.

Does this generate a global solution?

Wald-Ishizumi

Linear stability: linearized solution to Einstein equations (normalized modes) in  $L^2(\Sigma)$ .

( $\infty$ -dim't space)

These solutions are global + oscillatory — no decay or dispersion.

Theorem IF  $(M, g)$ . complete Riemannian Einstein, conformally compact then any Killing field on  $(\partial M, \delta)$  extends to a Killing field on  $(M, g)$ .

Kerr

