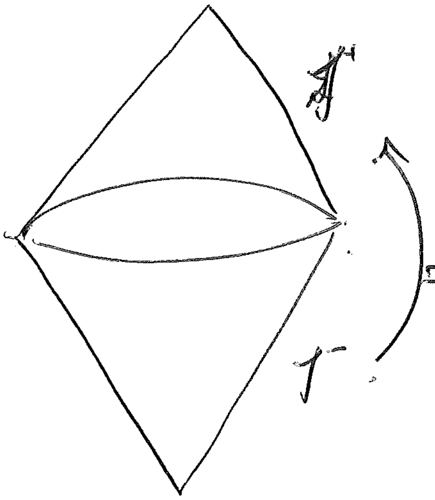
Lionel Mason 24/09/2015.



$$R^2 g = 2\,du\,dR + \frac{d\zeta\, d\bar{\zeta}}{(1+|\zeta|^2)^2} + R^2 du^2 .$$

$\Longrightarrow$ S matrix.

Gravitational phase space:

$$R^2 ds^2 = du\,dR + \frac{d\zeta\, d\bar{\zeta}}{(1+|\zeta|^2)^2} + \frac{R\, \sigma\, d\zeta^2 + c.c.}{(1+|\zeta|^2)^2} + O(R)$$

$\downarrow$

Asymp. gmm. data $\sigma(u, \zeta, \bar{\zeta})$ "shear".

$\mathcal{H}^+$ = phase space for σ, and has a symplectic structure.

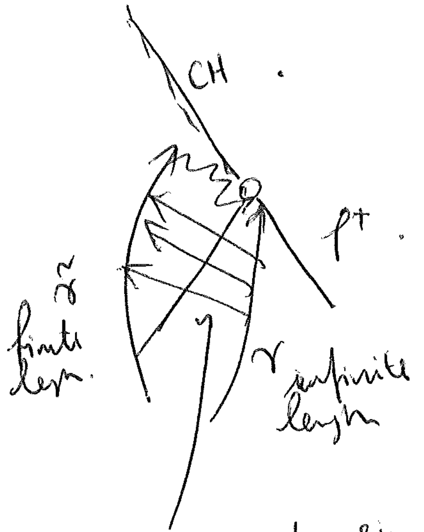
S-matrix: $\sigma_- \in \mathcal{H}_-$ solves Goursat problem

$$S[\sigma_-] = \text{renormalized Einstein action.}$$

Scattering $\sigma_+ = \mathcal{S}(\sigma_-)$

$$\Omega(\sigma_+, \sigma') = -\frac{d}{d\varepsilon} \mathcal{S}[\sigma_- + \varepsilon \sigma'] \Big|_{\varepsilon = 0}.$$

69; Argument by Penrose & __? $\Lambda = 0$.



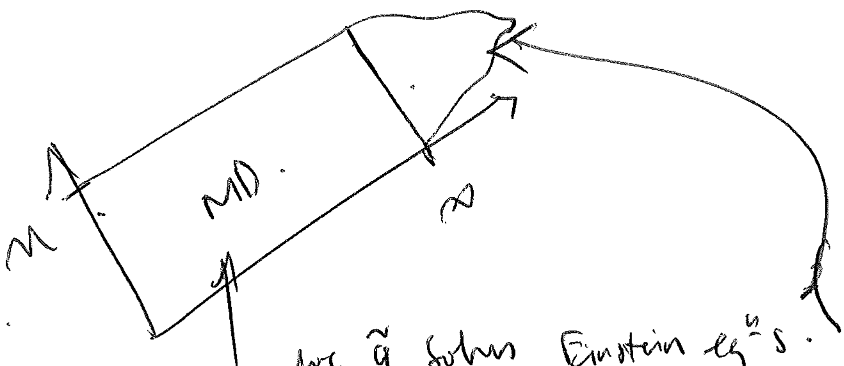
$\omega \to \infty$ ("Mass inflation").

γ sends signals, but infinitely many, so $\tilde{\gamma}$ sees infinite blue shift.

<u>Strong Cosmic Censorship:</u> Generically, MD is inextendible as a "suitably regular" Lorentzian manifold.

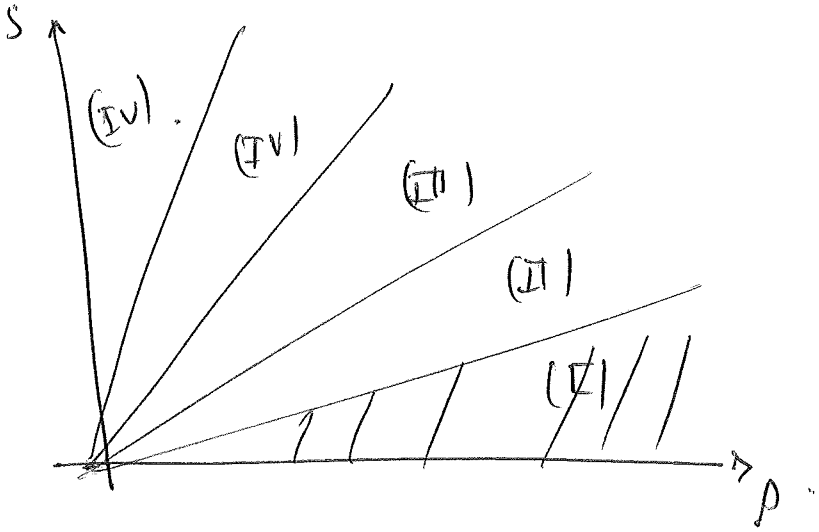
Suitably regular — C^2, C^0, square int. Christoffel coeff — $\Gamma \in L^2$. } need $\boxed{C^0 \setminus C^2}$ and actually,

C^0 extension



metric $\tilde{g}$ solves Einstein eq^{n}s.

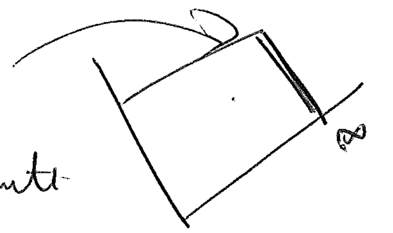
Extension, not necessarily solves Einstein but is C^0 and <u>extends</u> $\tilde{g}$.



$\partial_\mu \varphi \sim \mu^s$.

$1 < \rho = \frac{k_-}{k_+}$ = surface gravity → CH, → H

(I) $\varpi \to \infty$, $\nu \to \infty$



$\hat{\nu} = f(v)$ conditions
renorm.

$\mathrm{Ric}^2 \gtrsim \varpi^2 + O(1) \to \infty \Rightarrow \nexists$ C^2 ext.

→ get $\Gamma \notin L^2_{loc}$.

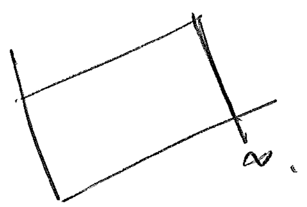
(II). $\varpi \to \infty$ in $\left|\frac{\partial_v \varphi}{\partial_v r}\right| \to \infty$, $\mathrm{Riem} \gtrsim \left(\frac{\partial_v \varphi}{\partial_v r}\right)^2$.

(III) – (IV) no mass inflation $\Leftrightarrow$ $|\varpi| < C \Rightarrow \Gamma \in L^2_{loc}$.

In (V) main thing to show $\left|\frac{\partial_v \varphi}{\partial_v r}\right| < C$.

$\Rightarrow$ go all the way to ∞.

with $\left|\frac{\partial_v \varphi}{\partial_v r}\right| \leq C$.



∃ classical sol^n of EMS in $C^1 \setminus C^2$, $\mathrm{Riem} \in C^0$.