Poster No.65

A note on trapped surfaces in the Oppenheimer-Snyder solution

Masahiro SHIMANO

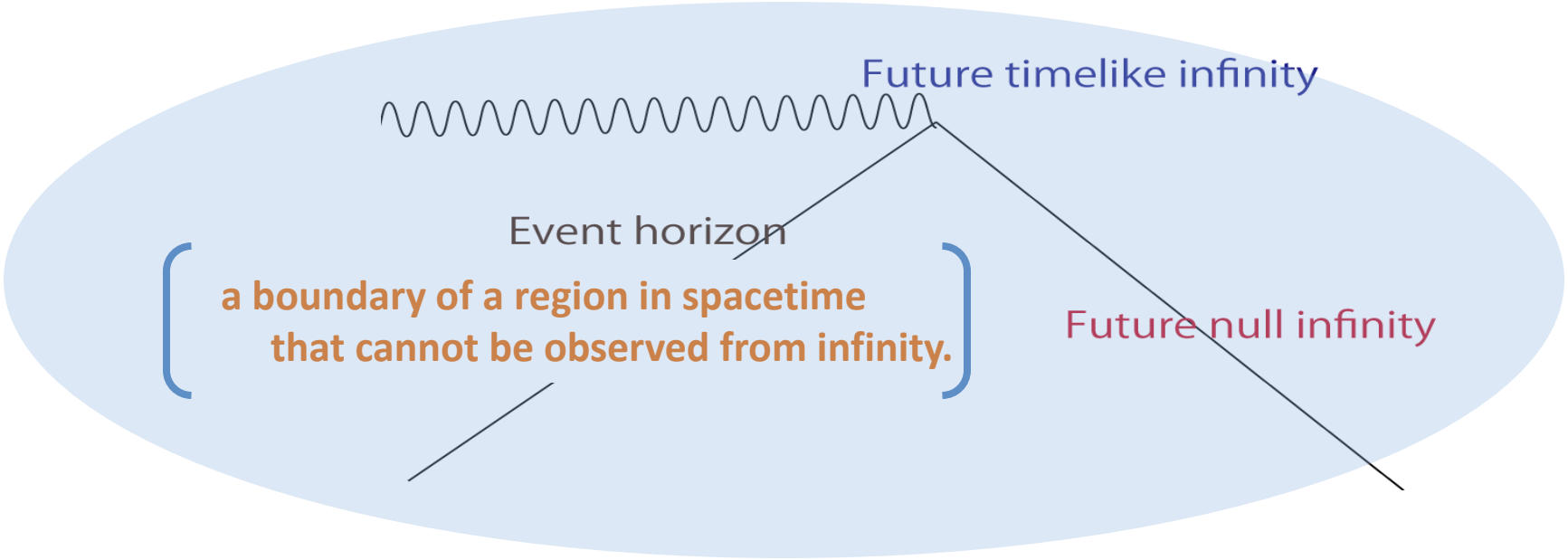
Rikkyo University, JAPAN

Collaboration with

Naoki TSUKAMOTO, Koji YAJIMA and Tomohiro HARADA

What is black hole

A black hole is defined by **an event horizon**



- ✓ Unless we know an entire future evolution of spacetime, we cannot define black holes.
- ✓ It might be difficult to study dynamical black holes by this definition .

Trapped surfaces might be useful to describe the boundary of black holes

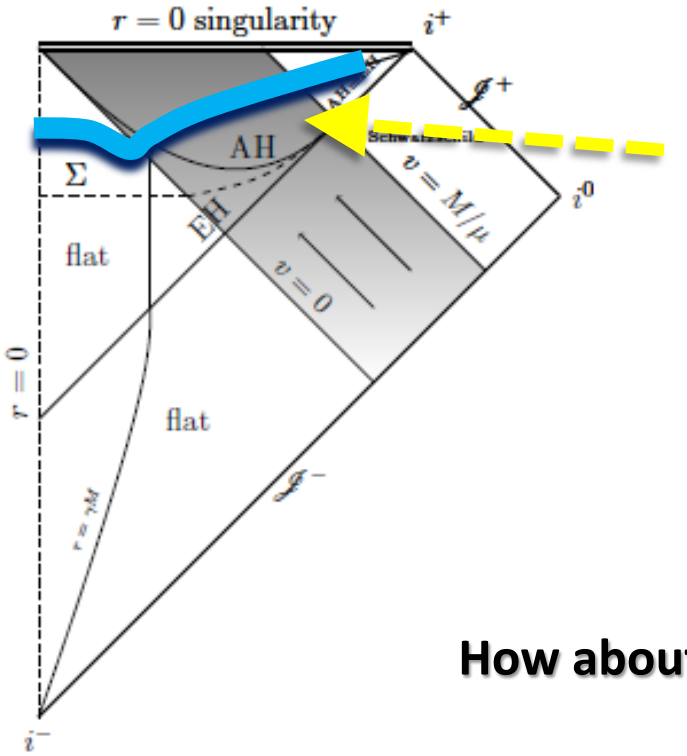
Trapped surfaces in Vaidya spacetime

Recently, trapped surfaces in Vaidya spacetime have interesting facts.

- ✓ **Trapped surfaces are extended into the flat region in Vaidya spacetime**

E. Schnetter and B. Krishnan, Phys. Rev, D 73, 021502(R) (2006).

I. Bengtsson, and J. M. M. Senovilla, Phys. Rev. D79 (2009) 024027.



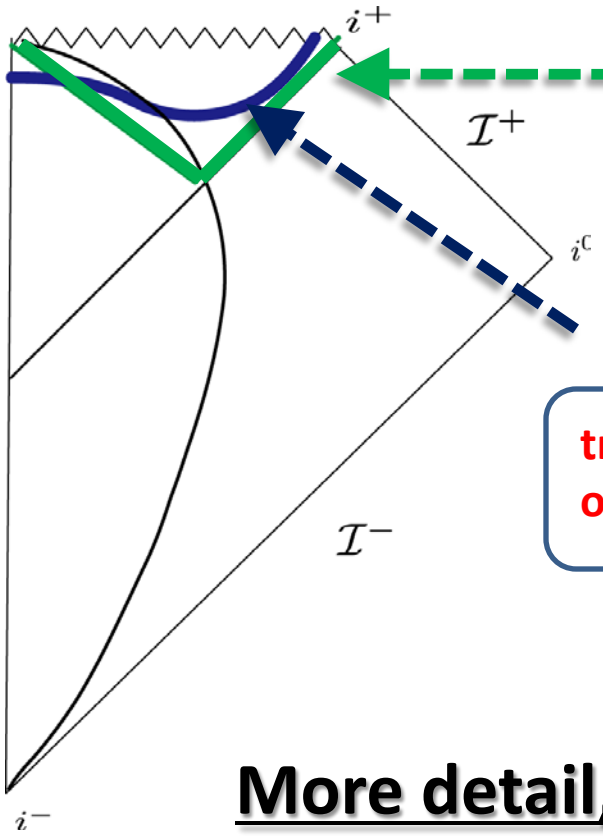
Trapped surfaces

Trapped surfaces are extended into the flat region (Trapped surfaces are extended outside the apparent horizon)

How about this fact in other spacetime??

Trapped surfaces in Oppenheimer-Snyder spacetime

In Oppenheimer-Snyder spacetime, we construct trapped surfaces extended outside the apparent horizon.



Apparent horizon

Trapped surfaces

trapped surfaces extended outside the apparent horizon.

More detail, please see poster No.65