Probing The Size of Extra Dimension from Gravitational Wave Astronomy

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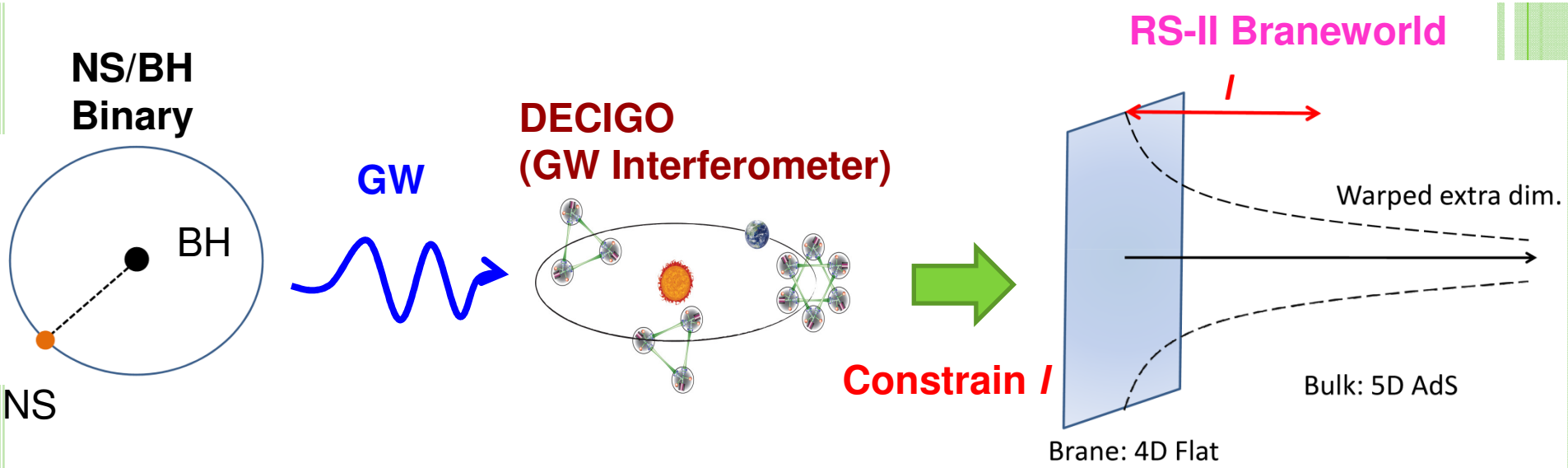
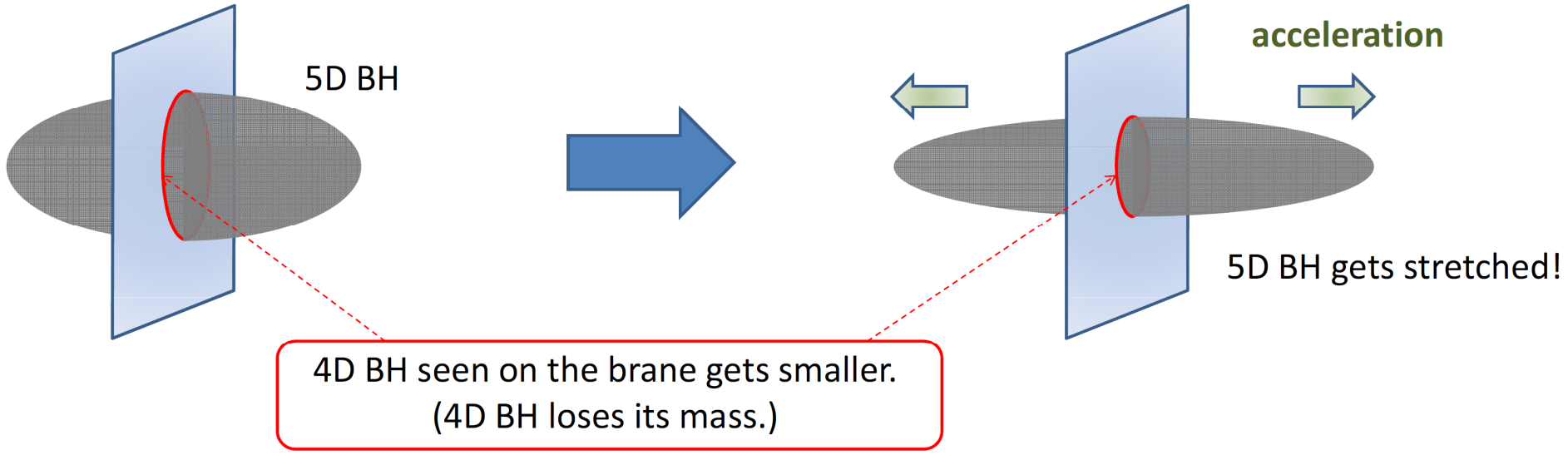


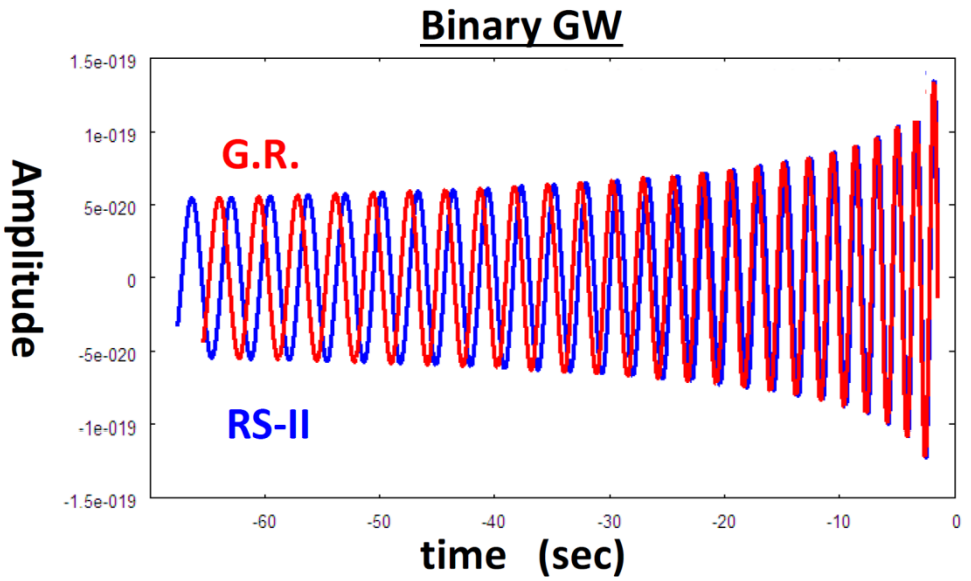
Estimating the possible constraint on **the size of extra dimension *l*** in **RS-II braneworld scenario** by detecting **GW** signal from **a NS/BH binary** with future-planned GW interferometers **DECIGO/BBO**.

- **Brane-localised BH** cannot be static. Emparan et al. (2003), Tanaka (2003)



・The mass loss effect changes **the orbital evolution** of a NS/BH binary.

Modification in GW waveform



・Performing **Fisher analysis**
⇒ constraint on *l*

Results

Possible constraint by DECIGO/BBO: $l < 3\,\mu$m

This is **almost 10 times stronger** than the current table-top experiment!!

DECIGO and BBO are very powerful in probing gravitational theories.