

Gravitational Wave Propagation & Shock formation in Modified gravity theory

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Based on H. S. Reall, B. Way, NT (arXiv: 1406.3379, 1409.3874), S. Ohashi (in prep.)

◆ **Modified gravity** = Einstein's General Relativity + **Correction**

- Predicted by fundamental theories
- Tested experimentally (Table-top, astrophysical obs., ...)

◆ **Modifications to gravity** → Modifications to **Gravitational Wave**

- GR : Gravitational wave propagates at the light speed
- Mod. grav.: Faster/slower propagation than the light speed?

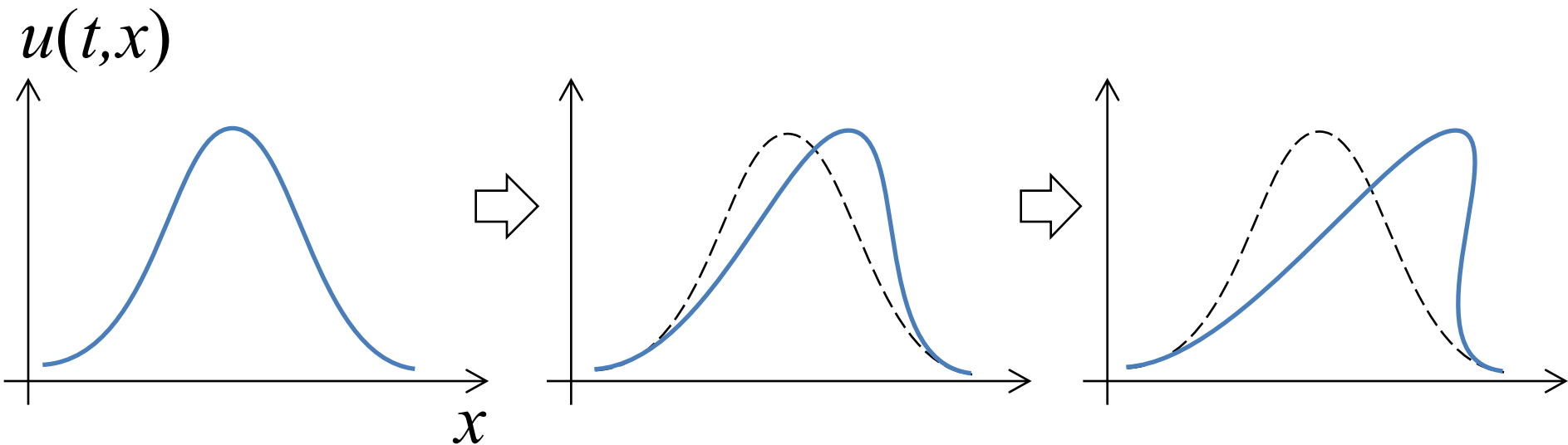
✓ GW may propagate **faster than the light** → **Any pathologies?**

✓ **Shock formation** due to non-constant propagation speed?

✓ Shock formation due to non-constant propagation speed?

Ex.) Burgers' equation $\partial_t u + u \partial_x u = 0$

- Wave propagation speed \neq const.
- Waveform distortion \rightarrow Shock formation



Does it occur for gravitational wave in modified gravity?