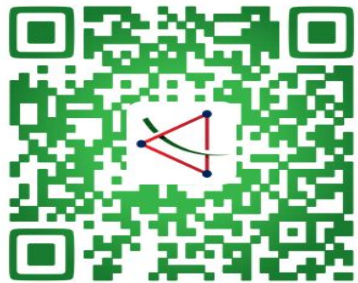


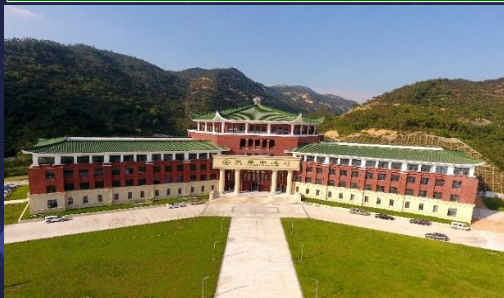
The effect of a constant velocity of the source on gravitational waves

Alejandro Torres-Orjuela • TianQin Center @ GR23

微信公众号



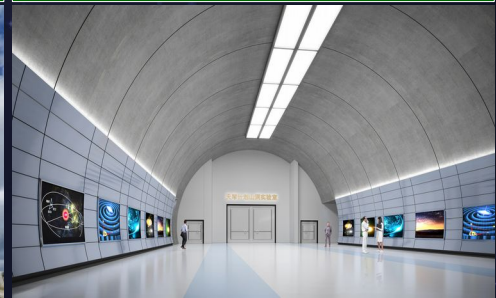
天琴中心大楼



激光测距台站

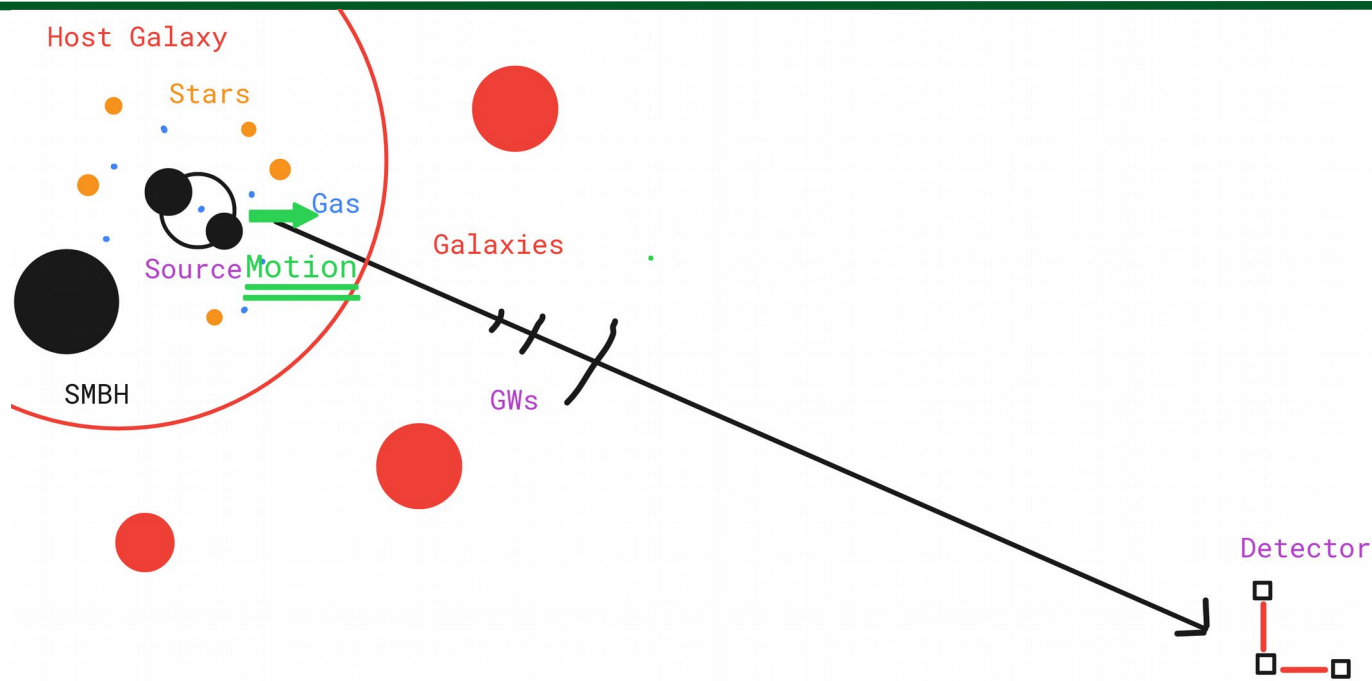
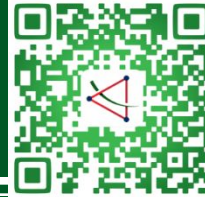


山洞实验室



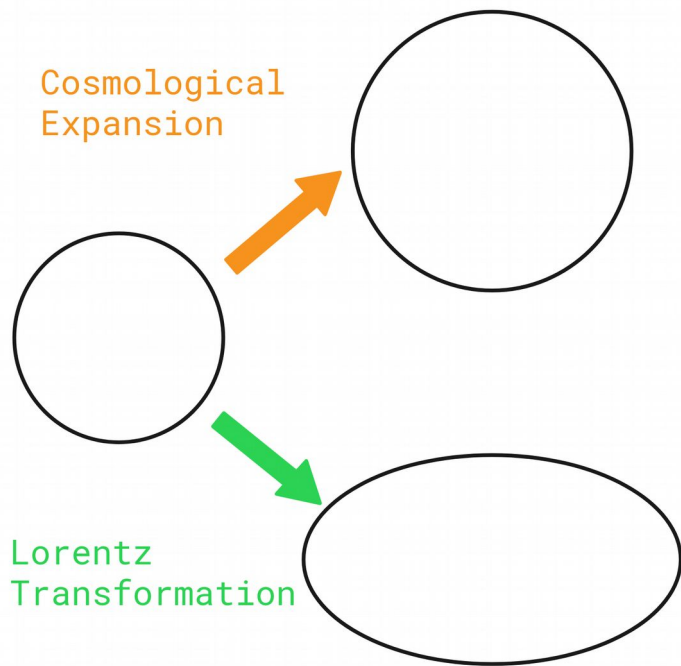


Realistic GW sources





Redshift \neq redshift



- *Global rescaling* \rightarrow Mass-redshift degeneracy
- *Velocity changes the scale in preferred direction* \rightarrow no mass-redshift degeneracy



The effect on the wave



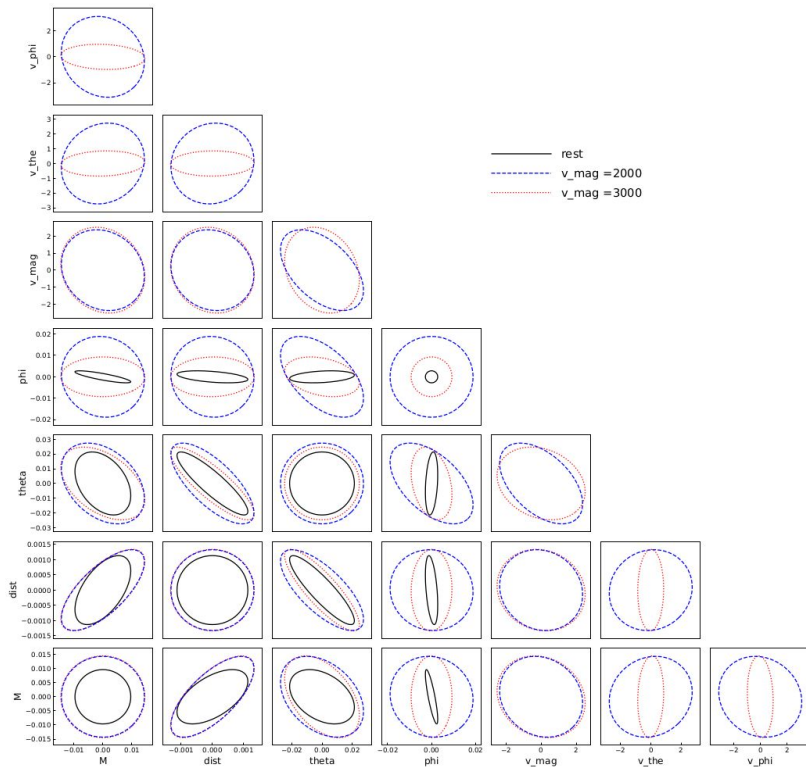
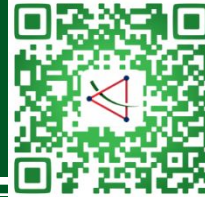
- The **transformed complex amplitude** of the wave takes the form:

$$H = e^{-2i\alpha} \frac{1}{D} H'(D\omega)$$

- mixing of +- and x-polarisation
- redshifted sources appear closer
- frequency changes direction-dependent



Detectability



- Credits: **Changqing Ye**
- Standard EMRI at 0.1 Gpc (SNR ≈ 200)
- **Vel. magnitude ~ 2 km/s, direction ~ 1 rad**
- **Other parameters affected**