



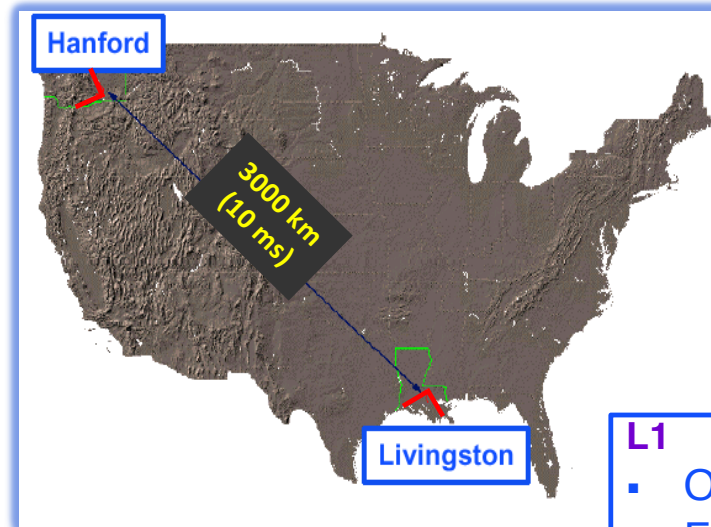
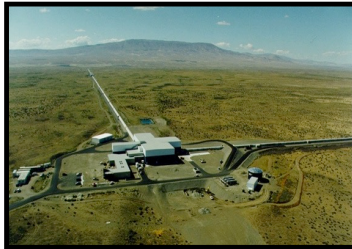
Update on LIGO instruments

OpenLVKEM town hall, 26 January 2023

B. O'Reilly, LIGO Lab, Livingston
LIGO-G2300149-v1

H1

- Improved sensitivity relative to O3.
- Frequency Dependent Squeezing observed.
- Working on low-frequency noise.



H1 & L1

- Significant periods of undisturbed running, useful for testing.

L1

- O3 functionality mostly recovered.
- Frequency-Dependent Squeezing observed.
- Working on achieving 400 kW circulating arm power



Summary of LIGO Improvement Goals



	Hanford, H1		Livingston, L1	
400 kW circulating arm power	✓		In Progress	
Squeezed light efficacy 4.5 dB	✓		✓	
300 m filter cavity for frequency-dependent squeezing	Installation complete	3.3 dB	Installation complete	~3 dB
Low frequency technical noise reduction (f < 100 Hz)	In Progress		✓	
Binary Neutron Star inspiral detection range: 160-190 Mpc	120 Mpc, w/out squeezing		130 Mpc, with squeezing, low power. (some extra low-f noise)	



Frequency Dependent Squeezing: H1 and L1

