GW-IaaS Online Tests (Mock Data Challenge)

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Suggested Hardware

- 2x Intel Xeon Gold 6342
- 256GB RAM
- 2x NVIDIA A30 GPUs connected by NVLink
Computing Resources: Triton Server

- **ASGC:**
  - Testing, maybe ready before 3/11
  - 2GPUs: 1080Ti or 3090

- **NCHC:**
  - Ready
  - 1GPU: A100
GW-IaaS: Client

- [https://github.com/ML4GW/DeepClean](https://github.com/ML4GW/DeepClean)
LIGO O3 Data

- **O3a**: 2019/04/01 15:00:00 (1238166018) ~ 2019/10/01 15:00:00 (1253977218)
- **O3b**: 2019/11/01 15:00:00 (1256655618) ~ 2020/03/27 17:00:00 (1269363618)
- Powerline and the side bands \((60*nHz, n = 1, 2, 3, \ldots)\)
- Low-frequency noise \((8Hz \sim 22Hz)\)
Virgo O3 Data

Have sent mail to Irene Fiori asking about useful PEM channels to subtract powerline noise in Virgo.
KAGRA O3GK Data

- O3GK: 2020/04/07 06:00:00 (1270274418) ~ 2020/04/20 00:00:00 (1271376018)
- Testing Deepclean by Software Noise Injection Test with the reference of the Hardware Noise Injection Test on 2020/06/11.
- 2020/06/11 06:21:02 (1275891680) ~ 2020/06/11 06:29:02 (1275892160)
Noise Estimation via Injection Tests

**Figure 4.** Correlation between the injection frequency $f'$ and output signal frequency $f$ derived from the single frequency acoustic injections in the PSL room (left) and in the PR booth (right).
Noise Estimation via Injection Tests

![Graphs showing noise estimation](image)

**Figure 5.** Snap shot of the single frequency acoustic injection in the PR booth at \( f' = 115 \text{ Hz} \). Top left: PSDs of the interferometer signal for injection data and background data. Bottom left: Same as the microphone signal and the approximated function of the injected noise. Top right: Ratio of injection PSD and background PSD (SNR) for the interferometer signal. Bottom right: Response function and its upper limit at \( f' = 115 \text{ Hz} \).
Noise Estimation via Injection Tests

Figure 7. Results of the broadband acoustic noise injection test in the PR booth. Top: PSDs of the microphone signal. Middle: PSDs of the interferometer signal. Bottom: The pure acoustic noise in the interferometer signal (blue) and the projection for them (red).
Performance Evaluation: GstLAL

Have sent mail to Ryan Magee for his suggestions on the mock data and testing the cleaned data by GstLAL.