Deepclean on O3GK: Glitch Problems

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Subtraction of 60Hz noise during O3GK run in KAGRA

- **O3GK run:**
  - 2020/04/07-06:00:00 (1270274418) ~ 2020/04/20-00:00:00 (1271376018) UTC

- **Strain data used:**
  - K1:DAC-STRAIN_C20

- **PEM channel used:**
  - K1:PEM-SENSOR_RACK_OMC1_DSUB2_OUT_DQ

- **Time:** 1270281600 ~ 1270282624 (1024 seconds)
Raw Strain Data: 1270281600 ~ 1270282624
Glitch in Strain: 1270282401 ~ 1270282403
Strain before Glitch: 1270282399 ~ 1270282401
Strain after Glitch: 1270282403 ~ 1270282405
PEM data: 1270281600 ~ 1270282624
Tests of Deepclean

- (No glitch; No glitch)
  - Training Time: 1270282112 ~ 1270282240 (128 seconds)
  - Clean Time: 1270282240 ~ 1270282368 (128 seconds)

- (No glitch; Glitch)
  - Training Time: 1270282230 ~ 1270282368 (128 seconds)
  - Clean Time: 1270282368 ~ 1270282496 (128 seconds)

- (No glitch, Glitch; Glitch, No glitch)
  - Training Time: 1270282274 ~ 1270282402 (128 seconds)
  - Clean Time: 1270282402 ~ 1270282530 (128 seconds)

- (Glitch; No glitch)
  - Training Time: 1270282638 ~ 1270282496 (128 seconds)
  - Clean Time: 1270282496 ~ 1270282624 (128 seconds)
(No glitch; No glitch): Raw Strain
(No glitch; No glitch): Subtracted Noise

Subtracted Noise (NN), GPS: 1270282240.0

Strain

Time (s)
(No glitch; No glitch): ASD
(No glitch; Glitch): Raw Strain
(No glitch; Glitch): Subtracted Noise
(No glitch; Glitch): ASD
(No glitch, Glitch; Glitch, No-glitch): Raw Strain
(No glitch, Glitch; Glitch, No-glitch): Subtracted Noise
(No glitch, Glitch; Glitch, No-glitch): ASD
Glitch Problems

- The raw strain after the glitch is 0 until the end of the time we crop, which may cost problems when we train Deepclean.
- The output of the dc-strain in (Glitch; No glitch) test is nan.
- In NGGN-test, Deepclean is trained before the glitch and output the predicted noise after the glitch, but we don’t have normal strain after the glitch.
- Should we avoid including glitches in the training dataset?
- Do we have to update a trained Deepclean model after the glitch?