LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY
- LIGO -
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Technical Note	LIGO-T2100045-LSC	2021/05/28

LIGO Data Quality Vetoes Applied to the Analysis of O3

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This document describes all the LIGO data quality (DQ) vetoes which were applied to the analysis of LIGO data from the third observing run. For each DQ flag the definition of the veto is given, the interferometer(s) for which this veto is applicable, the category the veto was applied to in the Burst and Compact Binary Coalescence (CBC) searches, and the total amount of deadtime associated with each DQ veto. Deadtime in this document refers to the amount of time removed from single-detector observing mode time for each veto individually. In the application of these DQ vetoes to the Burst and CBC searches some DQ vetoes will overlap in time and others may not be defined during coincident time. For the total amount of time removed for each detector at each category and additional details on the use of data quality vetoes, please see Davis et al. (arXiv:2101.11673).

1 Data Quality Vetoes in the Third Observing Run

Hardware Injections

1.1 Burst Hardware Injection Veto

Purpose: This veto indicates whenever a burst hardware injection has been performed.
Defintion: The times of transient hardware injections labelled as burst type are recorded by a system that monitors the state of the calibration injection model. Deadtime quoted includes the padding used in the analyses (± 4 seconds).
Name: H1:DMT-INJECTION_BURST, L1:DMT-INJECTION_BURST
Veto Category: Burst - 4[1], CBC - 2
Deadtime: LIGO Hanford - 0.000000%, LIGO Livingston - 0.000000%

1.2 CBC Hardware Injection Veto

Purpose: This veto indicates whenever a CBC hardware injection has been performed at either interferometer.
Defintion: The times of transient hardware injections labelled as CBC type are recorded by a system that monitors the state of the calibration injection model. Deadtime quoted includes the padding used in the analyses (± 8 seconds).
Name: H1:DMT-INJECTION_CBC
Veto Category: Burst - 4, CBC - 3[2]
Deadtime: LIGO Hanford - 0.000118%

1.3 DetChar Hardware Injection Veto

Purpose: This veto indicates whenever a Detector Characterization hardware injection has been performed at either interferometer.
Defintion: The times of transient hardware injections labelled as Detector Characterization type are recorded by a system that monitors the state of the calibration injection model.

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[1]Burst veto category 4 is reserved for transient hardware injections only.
[2]CBC veto category 3 is reserved for CBC hardware injections only.

Deadtime quoted includes the padding used in the analyses (±16 seconds).
Name: H1:DMT-INJECTION_DETCHAR, L1:DMT-INJECTION_DETCHAR
Veto Category: Burst - 4[3], CBC - 2
Deadtime: LIGO Hanford - 0.006043%, LIGO Livingston - 0.005304%

1.4 Stochastic Hardware Injection Veto

Purpose: This veto indicates whenever a stochastic hardware injection has been performed at either interferometer.
Defintion: The times of hardware injections labelled as stochastic type are recorded by a system that monitors the state of the calibration injection model.
Name: H1:DMT-INJECTION_STOCHASTIC, L1:DMT-INJECTION_STOCHASTIC
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.014798%, LIGO Livingston - 0.007164%

Category 1

1.5 Non-Stationary Data prior to Loss of Resonant Power in the Optical Cavities

Purpose: This vetoes times when the data became non-stationary before the state of the interferometer reported the end of an observation segment.
Definition: The last 4 seconds of an observation segment which ends suddenly due to a lock loss, i.e. when light stops being resonant in the arms, are automatically removed.
Name: H1:DMT-PRE_LOCKLOSS_4, L1:DMT-PRE_LOCKLOSS_4
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.000085%, LIGO Livingston - 0.000387%

1.6 Forklift Operation During Observing Mode

Purpose: This veto removes time when a forklift truck is active at either LIGO interferometer when in observing mode.
Definition: This flag was created by hand by taking times recorded in both LIGO Hanford (alog 48576) or LIGO Livingston (alog 46510) alogs[4].
Name: H1:DCH-FORKLIFT, L1:DCH-FORKLIFT
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.002269%, LIGO Livingston - 0.000410%

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[3]Burst veto category 4 is reserved for transient hardware injections only.
[4]Alogs are logbook entries that can be found at alog.ligo-wa.caltech.edu (for LIGO Hanford) or alog.ligo-la.caltech.edu (for LIGO Livingston)

1.7 Non-standard Interferometer Configuration

Purpose: This veto removes time when LIGO Livingston was operating outside of the standard configuration.
Definition: This flag was created by hand with times given in the LIGO Livingston alog 46755.
Name: L1:DCH-NON_O3_STANDARD_CONFIG
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Livingston - 0.000547%

1.8 Crane Operation During Observing Mode

Purpose: This veto removes time when a crane was operating in the main building (corner station) when LIGO Hanford was in observing mode.
Definition: This flag was created by hand, using times indicated in the LIGO Hanford alog 49117.
Name: H1:DCH-CRANE_VEA
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.008190%

1.9 Chillers Changing State

Purpose: This veto removes times when chillers were being turned on and off at LIGO Hanford as part of Physical Environment Monitor (PEM) test measurements. PEM test measurements are performed to understand how the environment can couple in to the gravitational-wave strain channel.
Definition: This flag was created by hand, using times indicated in LIGO Hanford alog 48645.
Name: H1:DCH-CHILLERS_ON_OFF
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.108588%

1.10 Large Truck On-Site for Liquid Nitrogen Delivery

Purpose: This veto removes times when liquid nitrogen trucks were on site at LIGO Livingston. Large trucks on site can cause noise to couple into the gravitational-wave strain channel.
Definition: This flag was created by hand, taking times indicated in LIGO Livingston alogs 47228 and 47232.
Name: L1:DCH-LN2_TRUCK
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Livingston - 0.042946%

1.11 Large Truck On-Site for Construction

Purpose: This veto removes times when cement trucks were on site at LIGO Hanford, which caused vibrations and noise in gravitational-wave strain channel.
Definition: This flag was created by hand, using times indicated in LIGO Hanford alog 53284.
Name: H1:DCH-CEMENT_TRUCK
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.077608%

1.12 High Parametric Instability Modes

Purpose: This veto removes times at LIGO Hanford when the RMS of any parametric instability (PI) mode is high. Parametric instabilities operate by transferring energy from the fundamental optical mode of the interferometer into an interferometer optic's mechanical mode.
Definition: This flag was generated automatically by thresholding on channels which monitor the amplitude of each PI mode of each test mass.
Name: H1:DCH-ANY_PI_HIGH_RMS
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.005126%

1.13 Elevated Violin Modes

Purpose: This veto indicates that the fundamental suspension fiber resonances, or "violin modes", had rung up to the point where they were causing the Output Mode Cleaner (OMC) photodiodes to saturate at either interferometers.
Definition: This veto was generated by removing times when the OMC photodiode saturates.
Name: H1:DCH-HIGH_VIOLINS, L1:DCH-HIGH_VIOLINS
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.001002%, LIGO Livingston - 0.033617%

1.14 Elevated ETMY Violin Mode

Purpose: This veto removes times when the End Test Mass Y (ETMY) violin mode was rung up at LIGO Hanford. During this time, there was a lot of glitching witnessed in the gravitational-wave strain channel which produced multiple gates. This period of excess gates causes issues for the transient searches to estimate the power spectral density, therefore the whole period of time is removed.
Definition: This flag was created by monitoring the "Long Gates" flag for times when there are too many 3 second gates close to eachother that the time gets severely disjointed.
Name: H1:DCH-ETMY_VIOLIN_MODE_RINGUP
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Hanford - 0.064881%

1.15   Severe Scattering

Purpose: This veto removes times of severe scattered light affecting LIGO Livingston due to high microseism.
Definition: This veto is created by thresholding on the micro-seismic ground motion.
Name: L1:DCH-SEVERE_SCATTERING
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Livingston - 0.658552%

1.16   Severe Whistles at LIGO Livingston

Purpose: Glitches caused by radio frequency (RF) beat notes are referred to as whistles. On Feb 4 2020 there was a severe whistle storm due to environmental seismic effects on the prestabilized laser system. The density of transient noise temporarily made searches for transient gravitational waves impractical, as observable from impacts on range and power spectral density estimation. This veto was made my hand.
Definition: The duration of the category 1 flag discarding stretches of data entirely was based on requiring an efficiency/deadtime of at least 20 with respect to several days of surrounding data, indicative of a very elevated glitch rate relative to normal operation. A separate category 2 flag was used to clean up whistles in less contaminated times prior to this flag.
Name: L1:DCH-SEVERE_WHISTLES_FEB4
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Livingston - 0.068306%

1.17   Missing Data Due to DAQ Failure

Purpose: This veto removes times when data are missing due to a failure in the data acquisition system at LIGO Livingston.
Definition: This flag was created by hand, using times indicated in LIGO Livingston alog 52082.
Name: L1:DCH-DAQ_FAILURE_MISSING_DATA
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Livingston - 0.002096%

1.18   Missing C01 Segment

Purpose: This veto removes times that have not been calibrated correctly when creating a new calibration version of the gravitational-wave strain data at LIGO Livingston.
Definition: This flag was created by hand, using times indicated by the LIGO calibration group.
Name: L1:DCH-O3_C01_SEG_MISSING
Veto Category: Burst - 1, CBC - 1
Deadtime: LIGO Livingston - 0.000036%

Category 2

1.19   Saturations of Squeezer Angular Sensing and Control

Purpose: This LIGO Livingston flag vetoes times of software saturations in squeezer channels corresponding to spikes in control signals of the mirrors steering the beam from the squeezer into the interferometer. This issue was only observed in the first few weeks of O3a.
Definition: Vetoed times are constructed from recorded software saturations of four different squeezer alignment sensing and control channels with observed correlation to glitches in the gravitational wave strain channel.
Name: L1:DCH-SQZ_SATURATIONS
Veto Category: Burst - 2, CBC - 2
Deadtime: LIGO Livingston - 0.007834%

1.20   Camera Shutter Vibrations

Purpose: Vetoes periodic glitches around 70 Hz caused by a shutter on an automated camera in End-Y station at LIGO Livingston.
Definition: A beamtube accelerometer was used to identify times when the camera shutter was causing vibrations.
Name: L1:DCH-PEM_EY_ACC_BEAMTUBE_OMICRON_GT_100
Veto Category: Burst - 2, CBC - 2
Deadtime: LIGO Livingston - 0.018433%

1.21   Large Earthquake Geographically Close to LIGO Hanford

Purpose: This veto removes times at LIGO Hanford when an earthquake in California caused an odd "ringing" response for 3 minutes in the gravitational-wave strain channel which is known to adversely affect transient searches.
Definition: This flag was created by hand, by consulting seismic trends and spectrograms of the LIGO-Hanford strain data.
Name: H1:DCH-REALLY_CLOSE_EARTHQUAKE
Veto Category: Burst - 2, CBC - 2
Deadtime: LIGO Hanford - 0.000847%

1.22   Thunder Noise at Corner Station

Purpose: This veto removes times when acoustic noise related to thunderstorms at LIGO Livingston coupled into the gravitational-wave strain channel and caused multiple seconds of excess noise.
Definition: This flag was created by taking the band limited RMS (BLRMS) of a microphone located at Horizontal Access Module (HAM) 2 and removing times when this output went above 300 ($\sim$60 mPa).
Name: L1:DCH-THUNDER_MIC_BP_GT_300
Veto Category: Burst - 2, CBC - 2
Deadtime: LIGO Livingston - 0.015526%

1.23 Severe OM3 Scattering

Purpose: This veto removes times of severe scattering at LIGO Livingston as predicted by the OM3 mirror motion.
Definition: This flag was created by monitoring the motion of the OM3 mirror to remove times when the motion was too high.
Name: L1:DCH-SEVERE_OM3_SCATTER
Veto Category: Burst - 2, CBC - 2
Deadtime: LIGO Livingston - 0.014806%

1.24 45 MHz Sideband Fluctuations

Purpose: This veto removes times at LIGO Livingston when the the 45 MHz amplitude control glitches and couples into all vertex degrees of freedom and the gravitational-wave strain channel.
Definition: This veto was created by whitening the 45 MHz control signal and removing times when the signal exceeded 1.75.
Name: L1:DCH-WHITENED_RF45_AM_CTRL_GT_1P75
Veto Category: Burst - 2, CBC - 2
Deadtime: LIGO Livingston - 0.039286%

1.25 Whistles Related to Incorrect PSL FSS Gain

Purpose: On the first official day of O3a, an incorrect Pre Stabilised Laser (PSL) Frequency Stabilization Servo (FSS) gain setting resulted in loud transient noise, also known as whistles, typically of a few seconds duration at LIGO Livingston. The morphology of these whistles was distinctly more complex than the "V" or "W" morphology typically created by whistles/RF beatnotes.
Definition: A threshold on the BLRMS content of an Length Sensing Contol (LSC) - Power Recylcing Cavity Length (PRCL) channel was selected as a witness to determine the presence of these whistles.
Name: L1:DCH-LSC_PRCL_IN1_GT_P075
Veto Category: Burst - 2, CBC - 2
Deadtime: LIGO Livingston - 0.008389%

1.26 Whistles Related to Environmental Effects at LIGO Livingston

Purpose: This flag was designed to be used along with the severe whistle flag described in the category 1 section, and terminates at the start time of that flag. It produces vetoes of ∼seconds duration to remove individual whistles, up until the severity of the whistle storm renders this method impractical.
Definition: To determine the presence of whistles, an signal-to-noise ratio (SNR) threshold is set on omicron triggers of central frequency 50 Hz or greater produced by an auxiliary witness channel. Omicron is an unmodelled transient detection pipeline that broadly performs a multi-Q transform given some data stream, then searches for significant clusters of

tiles in time-frequency space, optimizing over the quality factor.
Name: L1:DCH-WHISTLES
Veto Category: Burst - 2, CBC - 2
Deadtime: LIGO Livingston - 0.036365%

1.27   Long Gates

Purpose: Gating is used to remove high amplitude noise transients from gravitational-wave strain data, by multiplying the data by an inverse window function. This veto removes times when a gate is longer than 3 seconds, as a gate of this length or more is known to bias estimation of the power spectral density in CBC analyses. A version of this flag covers both interferometers.
Definition: This flag was constructed by monitoring a system automatically records the gating times.
Name: H1:DCH-GATES_GT_3SEC, L1:DCH-GATES_GT_3SEC
Veto Category: Burst - not used, CBC - 2
Deadtime: LIGO Hanford - 0.065672%, LIGO Livingston - 0.023318%

1.28   Earthquakes with Ground Motion BLRMS above 1000nm/s

Purpose: This veto removes times when earthquakes were causing extremely high ground motion at LIGO Hanford. We created this flag based upon the output of a ground sesmometer located at the corner station.
Definition: This flag was created by taking the Band Limited RMS (BLRMS) of the output of this seismometer in the Z direction (i.e. up and down) and created the veto whenever the BLRMS went above 1000 nm/s.
Name: H1:DCH-EARTHQUAKE_CS_Z_BLRMS_GT_1000
Veto Category: Burst - not used, CBC - 2
Deadtime: LIGO Hanford - 0.065988%

1.29   Earthquakes with Ground Motion BLRMS above 600nm/s

Purpose: This veto removes times when earthquakes were causing high ground motion. We created this flag based upon the output of a ground seismometer located at the corner station. This is comparable to the previous flag, but has been retuned for LIGO Livingston.
Definition: This flag was created by taking the Band Limited RMS (BLRMS) of the output of this sesimometer in the Z direction (i.e. up and down) and created the veto whenever the BLRMS went above 600 nm/s.
Name: L1:DCH-EARTHQUAKE_CS_Z_BLRMS_GT_600
Veto Category: Burst - not used, CBC - 2
Deadtime: LIGO Livingston - 0.029712%

1.30 Large Earthquakes Occuring when Interferometer not in Earthquake Mode

Purpose: This veto removes times when an earthquake caused glitching in the gravitational-wave channel, and LIGO Hanford was not in earthquake mode.
Definition: This flag was created by taking the Band Limited RMS (BLMRS) of the output of this sesimometer in the Z direction (i.e. up and down) and created the veto whenever the BLRMS went above 200 nm/s, and the interferometer was not in earthquake mode.
Name: H1:DCH-NO_EQ_MODE_BLRMS_GT_200
Veto Category: Burst - not used, CBC - 2
Deadtime: LIGO Hanford - 0.005930%

1.31 Thunder Noise at End-Y

Purpose: This is a supplemental flag that removes times when acoustic noise related to thunderstorms at LIGO Livingston coupled into the gravitational-wave strain channel and caused multiple seconds of excess noise.
Definition: This flag was created by taking the band limited RMS (BLRMS) of a microphone located at the End-Y station and removed times when this output went above 250 ($\sim$50 mPa).
Name: L1:DCH-THUNDER_EY_MIC_BP_GT_250
Veto Category: Burst - not used, CBC - 2
Deadtime: LIGO Livingston - 0.014751%

1.32 High Building Tilt from Wind

Purpose: This veto removes times of high wind at LIGO Hanford.
Definition: This veto is created by removing times when the beam rotation sensor (BRS) located at End-Y has a rotation above 11 mrad.
Name: H1:DCH-BRS_EY_TILT_GT_11_MRAD
Veto Category: Burst - not used, CBC - 2
Deadtime: LIGO Hanford - 0.133627%

1.33 Saturation in ETMY electrostatic drive control signal

Purpose: This veto indicates that the drive signal controlling the End Test Mass (ETMY) electrostatic drive has hit the limit of the digital-to-analog converter. This is typically due to a high amplitude transient amidst otherwise nominal operation.
Definition: This veto is defined by monitoring the real time diagnostics on the system that controls the digital-to-analog converter at LIGO Livingston.
Name: H1:DMT-ETMY_ESD_DAC_OVERFLOW, L1:DMT-ETMY_ESD_DAC_OVERFLOW
Veto Category: Burst - 2, CBC - not used. This flag is captured by CBC Gating Times
Deadtime: LIGO Livingston - 0.018884%

1.34 Saturation in ETMX electrostatic drive control signal

Purpose: This veto indicates that the drive signal controlling the End Test Mass X (ETMX) electrostatic drive has hit the limit of the digital-to-analog converter. This is typically due to a high amplitude transient amidst otherwise nominal operation.
Definition: This veto is defined by monitoring the real time diagnostics on the system that controls the digital-to-analog converter at either interferometer.
Name: H1:DMT-ETMX_ESD_DAC_OVERFLOW, L1:DMT-ETMX_ESD_DAC_OVERFLOW
Veto Category: Burst - 2, CBC - not used. This flag is captured by CBC Gating Times
Deadtime: LIGO Hanford - 0.015527%, LIGO Livingston - 0.001659%

1.35 Output Mode Cleaner (OMC) Photodiodes Analog to Digital Overflows

Purpose: This veto captures times when the signal on the OMC photodiodes exceeds the limit of the analog-to-digital converter at the interface to the computers that control either interferometer.
Defintion: This veto was created automatically by monitoring the interface between the OMC photodiodes analog signal and the computers.
Name: H1:DMT-OMC_DCPD_ADC_OVERFLOW, L1:DMT-OMC_DCPD_ADC_OVERFLOW
Veto Category: Burst - 2, CBC - not used. This flag is captured by CBC Gating Times
Deadtime: LIGO Hanford - 0.127429%, LIGO Livingston - 0.047689%

1.36 Whistles at LIGO Hanford

Purpose: Vetoes whistles, i.e. RF beatnotes, which occurred periodically throughout O3 at LIGO Hanford. Higher whistle rates were generally associated with periods of high anthropogenic or earthquake band seismic noise, as quieter periods left the Input Mode Cleanr (IMC) Voltage Controlled Oscillator (VCO) at a stable frequency that did not result in whistles.
Definition: The photodiode (called LSC-REFL which measures reflected light in the interferometer) was selected among many auxiliary channels which witness whistles based on its performance as measured by efficiency/deadtime for omicron triggers. A high signal to noise ratio (SNR) threshold (>100) was used to veto strong whistles interfering with the analysis, but keep deadtime to the minimum necessary.
Name: H1:DCH-WHISTLES
Veto Category: Burst - 2, CBC - not used
Deadtime: LIGO Hanford - 0.156831%

1.37 Whistles Related to RF9

Purpose: This is a supplemental flag for whistles for a single week in early O3 when the standard LIGO Hanford whistle flag was failing to clean up the observed whistle population by itself.
Definition: The photodiode (called RF9 which measures light from the 9MHz sideband) was selected as a good auxiliary channel to whitness the whistle glitches. Omicron triggers of

this channel with a signal to noise >15 and central frequency>100Hz were used to construct the veto.
Name: H1:DCH-WHISTLES_RF9
Veto Category: Burst - 2, CBC - not used
Deadtime: LIGO Hanford - 0.003182%

1.38   Loud Glitches

Purpose: This is a veto for high signal to noise ratio (SNR) glitches associated with light intensity dips which occurred throughout O3. Both LIGO Hanford and LIGO Livingston experienced these glitches.
Definition: A channel which monitors the output of the pickoff port photodiode was used to determine the presence of a loud glitch in the interferometer. The exact frequency and SNR thresholds varied depending on the interferometer and time period in order to maintain high efficiency/deadtime.
Name: H1:DCH-POP_LOUD_GLITCHES, L1:DCH-POP_LOUD_GLITCHES
Veto Category: Burst - 2, CBC - not used
Deadtime: LIGO Hanford - 0.441293%, LIGO Livingston - 0.295410%

1.39   Loud Glitches Observed Transmon

Purpose: The pickoff port photodiode ceased being a useful witness for the high SNR glitches described in the previous entry for the O3b period in the LIGO Livingston detector, likely due to changes in shrouding to reduce light scattering. This flag replaces the previous loud glitch flag for O3b.
Definition: A transmission monitor auxiliary channel was used to witness loud glitches after the pickoff port photodiode became ineffective. A threshold was set on omicron triggers produced by the channel (SNR>10, central frequency>8 Hz).
Name: L1:DCH-TR_X_LOUD_GLITCHES
Veto Category: Burst - 2, CBC - not used
Deadtime: LIGO Livingston - 0.162782%

1.40   RF45 Noise

Purpose: This veto removes times at LIGO Livingston when the the 45 MHz amplitude control glitches and couples into all vertex degrees of freedom and the gravitational-wave strain channel. This flag is a supplement to one already defined.
Definition: An auxiliary channel which monitors the alignment sensing and control of the common arm HARD mode was used. Omicron triggers were produced for this channel and the veto was constructed by taking triggers with a signal to noise ratio>25 and frequency>10.
Name: L1:DCH-RF45_ASC_CHARD
Veto Category: Burst - 2, CBC - not used
Deadtime: LIGO Livingston - 0.008353%

1.41 Intermittent PSL Noise

Purpose: This veto removes time due to intermittent noise in the pre-stabilized laser (PSL) at a few hundred Hz and above. This noise was typically only a secondary issue for short duration burst searches but posed a more serious problem for some long duration burst searches. The PSL noise recurred sporadically throughout O3, so the flag is defined for most of the run duration but is only utilized for periods in which it has high efficiency/deadtime.
Definition: The flag is active for times in which the BLRMS of the PSL frequency stabilization servo auxiliary channel is above a threshold of 0.3, for a broad frequency band of 10 to 2000 Hz.
Name: H1:DCH-PSL_FSS_BLRMS_GT0P3
Veto Category: Burst - 2, CBC - not used
Deadtime: LIGO Hanford - 0.073509%

1.42 High Frequency Noise Caused by a Piezoelectric Transducer

Purpose: Vetoes noise above 1 kHz attributed to piezoelectric transducer that controls microscopic length of the output mode cleaner.
Definition: An output mode cleaner piezoelectric trandsducer monitoring channel produced an omicron trigger with SNR>7 with a central frequency above 1 kHz.
Name: H1:DCH-OMC_PZT1
Veto Category: Burst - 2, CBC - not used
Deadtime: LIGO Hanford - 0.000447%

1.43 Excited Violin Mode Second Harmonic

Purpose: This flag vetoes an extended period with an excited violin mode second harmonic in Hanford. This time period was creating major problems for background estimation of burst searches due to a similar issue of less severity creating glitches of nearly the same frequency and bandwidth at Livingston.
Definition: The flag was created by using an auxiliary channel which monitored the damping of the violin mode. The duration of the veto had to be determined based on favorable efficiency/deadtime for omicron triggers of this channel.
Name: H1:DCH-VIOLIN_MODE_NOV12
Veto Category: Burst - 2, CBC - not used
Deadtime: LIGO Hanford - 0.008472%