

SNEWS Update

Neutrino 2016

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- What's new since Nu2014
- Review of operational mode/nomenclature
- Operational mode history
- Other notes
- Proposals

Since last SNEWS meeting at Neutrino 2014:

- **Server code has been running with very little downtime at BNL;**
regular shift checks by SNEWS 'subgroup'
- **Backup server at the U. of Bologna also running smoothly**
 - receives alarms from clients
 - email output only enabled if other server or BNL network disabled (few times per year)
 - part of regular shift check
- **Grant from NSF renewed through mid-2018**
(undergrad+outreach+travel)



Operational Mode History

Fall 2013: operational mode **5.0**

SK+LVD+Borexino+IceCube+KamLAND

November 2014: **6.0**, add Daya Bay

October 2015: **7.0**, add HALO

Packet Types

Packet types

PING: test only

ALARM: action depends on level flag

RETRACTION: remove alarm from queue in
time windows (for given expt)

Level flags (decided by individual experiment)

TEST: for test queue

POSSIBLE: for alarm queue, lower quality

GOOD: for alarm queue, all OK

RETRACTED: removal packet (redundant)

OVERRIDE: for alarm queue, confirmed good

Coincidence Alert Types

**GOLD alert: clean, unambiguous
AUTOMATED alert, to
experimenters and astronomers**

**SILVER alert: coincidence with
one or more problems, to
experimenters only (NOT lost, just delayed)**

- calibration or other tag on any alarm
- too few in coincidence at distant locations
- history of high rate

Experiments define procedure for each

GOLD alert must have *all* of the following conditions met: (otherwise, it's SILVER)

1. A two- or more fold coincidence within 10 seconds



→ modify for more experiments?

2. At least two experiments at different laboratories



3. Two or more alarms flagged as GOOD



4. Rate of alarms in past time intervals for at least 2 experiments involved must not be too high



(require $<1/100$ yr accidental coincidence)

Notes on Rate Lookback Criterion

For intervals $\{T_i\}=\{10 \text{ min}, 1 \text{ hr}, 10 \text{ hr}, 1 \text{ d}, 3 \text{ d}, 1 \text{ wk}, 1 \text{ mo}\}$

require *consistency with specified rate*,
depending on no. of active experiments

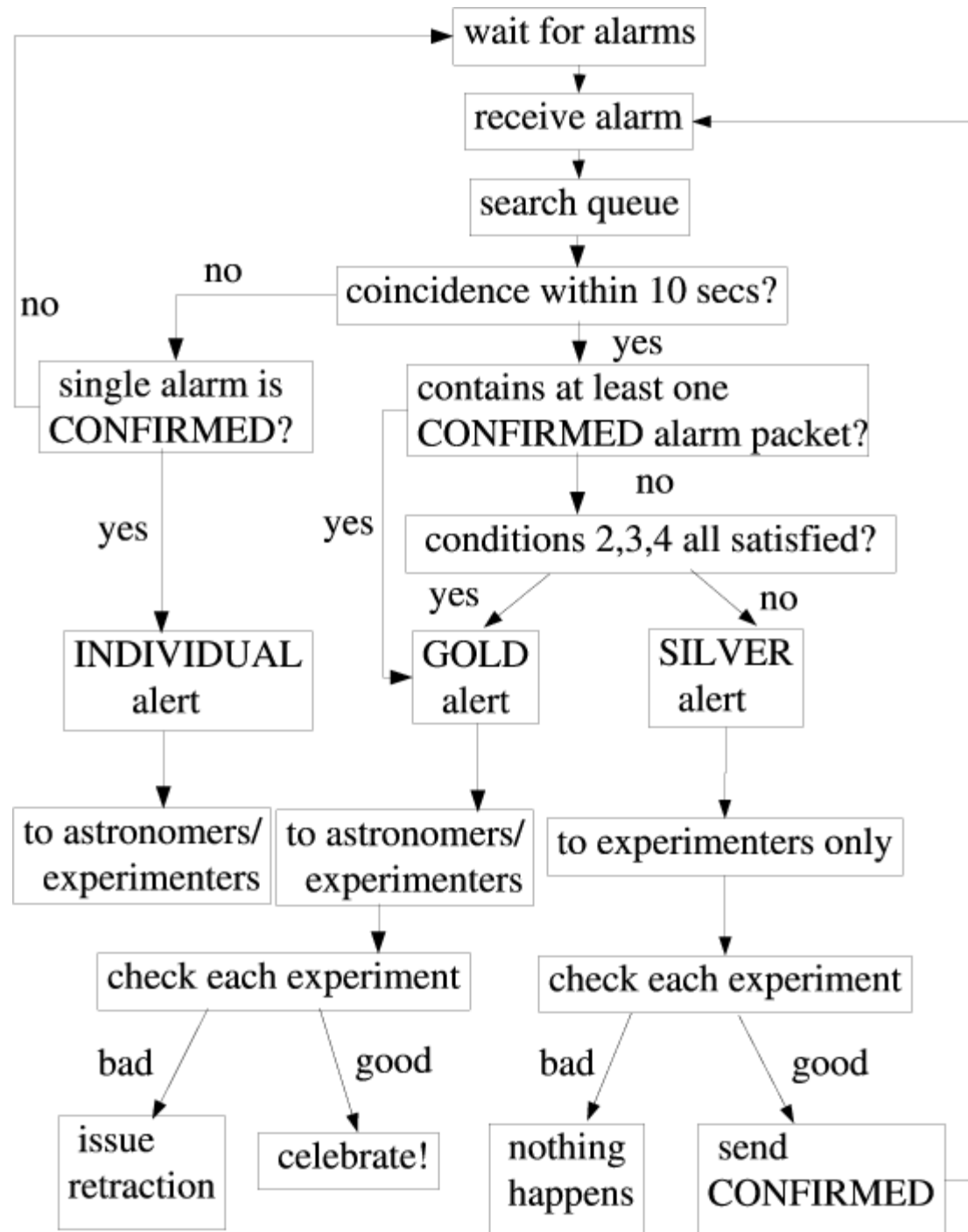
For the $\{n_i\}$ alarms sent by each experiment,
require the Poisson probabilities $\{P_i\}$

$$P_i = \sum_{n=n_i}^{\infty} (\lambda_{\max} T_i)^n e^{-\lambda_{\max} T_i} / n!$$

each to be greater than $P_{\text{thr}} = 0.002$

[Current λ_{\max} is 1/14 days, for 7 experiments]

Flowchart



Alert Dissemination

- **PGP-signed** email sent to **snews-alert** mailing list maintained at BNL (anyone can sign up)
...currently has 3576 members
- Addresses include Sky&Telescope AstroAlert mailing list
- Subscriber list is private for SPAM/security reasons but is available upon request
- `Express-line' output to *experiments* upon request (+ ANTARES, LIGO)
- New: **GCN connection** (GRB coordinates network) formally established December 2015:
formatted email with same info as SNEWS
alert made available

GCN Test emails Tuesdays, noon Eastern

Planned Downtime Table

This table is automatically generated.

NOTE THAT ALL TIMES ARE IN UTC

Only recent entries are printed.

Entry No.	Experiment	Start Date and Time				End Date and Time				Grade	Comment
		Year	Month	Day	Hour	Year	Month	Day	Hour		

Grading corresponds to the following rough levels:

- Red: Detector is completely dead.
- Yellow: Detector is mostly sensitive to a supernova burst but alarm is offline (e.g. during calibrations).
- Green: Detector is on but alarm is offline.

Click [here](#) to download an entry form.

Problems, questions, suggestions? Send email to snews-downtime@snews.bnl.gov

Planned Downtime Entry Form

Entry number:

☒ New ☐ Modify ☐ Delete

Name of person entering record:

E-mail:

Experiment:

ANONE (The Almost Never Off Neutrino Experiment)
IceCube
KamLAND
LVD
Borexino
Super-Kamiokande

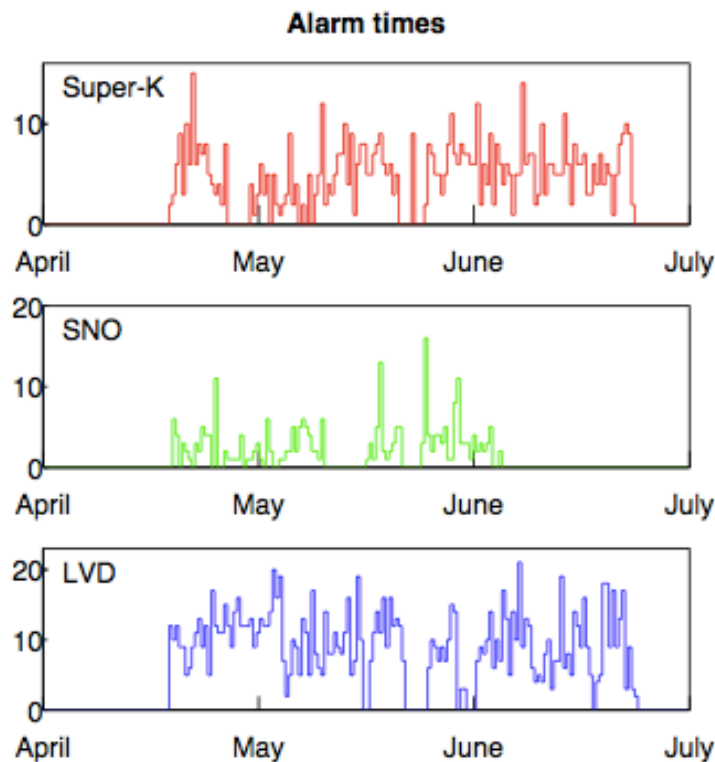
Short descriptive comment (e.g., "Calibration", "Power Outage", etc.):

Start of Downtime:

Year:	Month:	Day:	Hour:	Minute:	Time Zone:
2010	January	1	00		UTC
2011	February	2	01		America/Montreal
2012	March	3	02	00	Asia/Tokyo
2013	April	4	03	15	US/Eastern
2014	May	5	04	30	US/Central
	June	6	05	45	US/Mountain
	July	7	06		US/Pacific
	August	8	07		Europe/Rome

Moving Forward

- **SNEWS app:** project for student in fall
- New “high-rate” test, as per 2004 paper (fall?)



➔ 7 expts,
new paper

- Workshop in spring: stay tuned

Summary

SNEWS server running smoothly at BNL
with backup at Bologna:
SK IV, LVD, Borexino, IceCube, KamLAND
DB, HALO

Version 7.0 of operational mode in effect

High-rate test in fall + workshop in Spring

Don't forget about the downtime page