



Commissioning, Operations, and Reliability Status

Tom Himel



Co-conspirators

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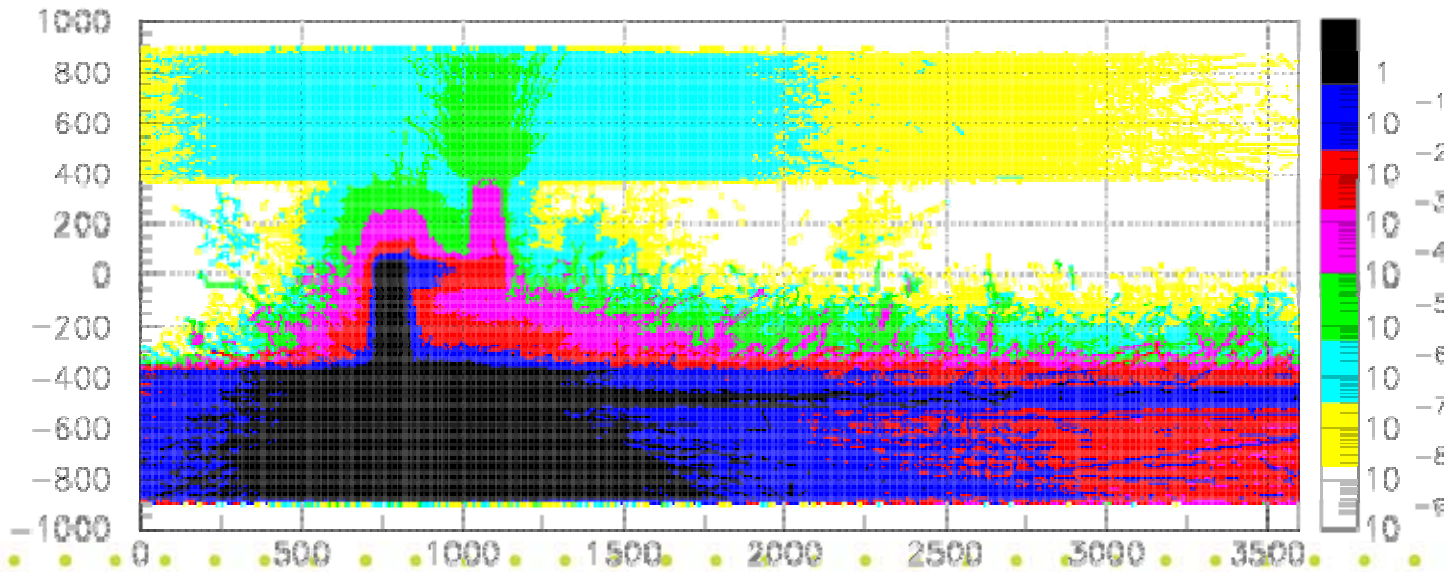
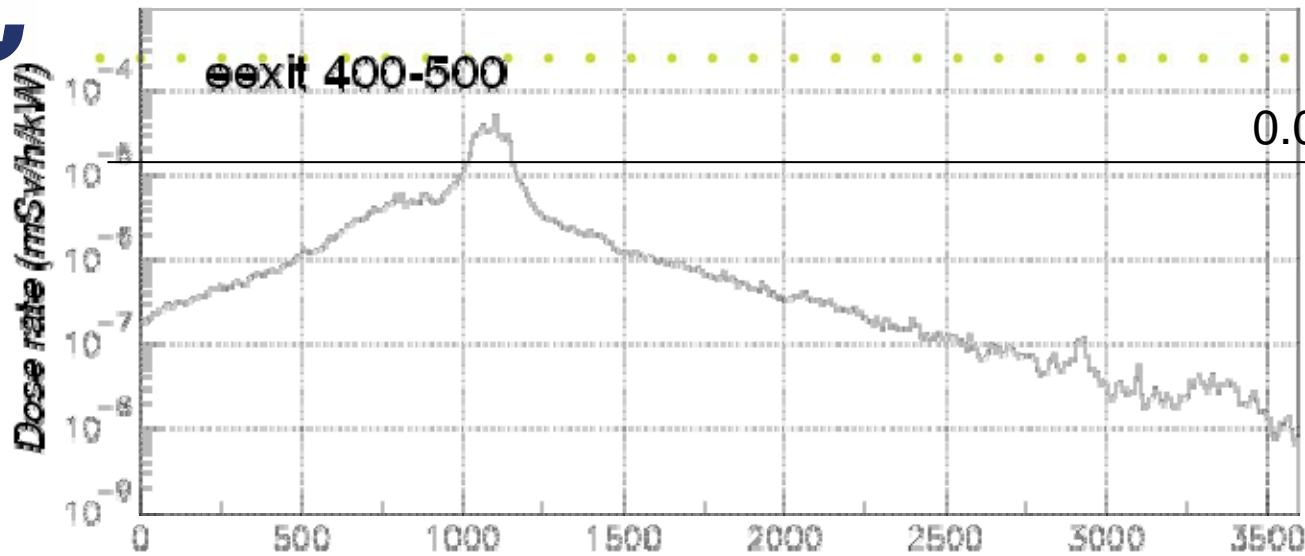
Overview

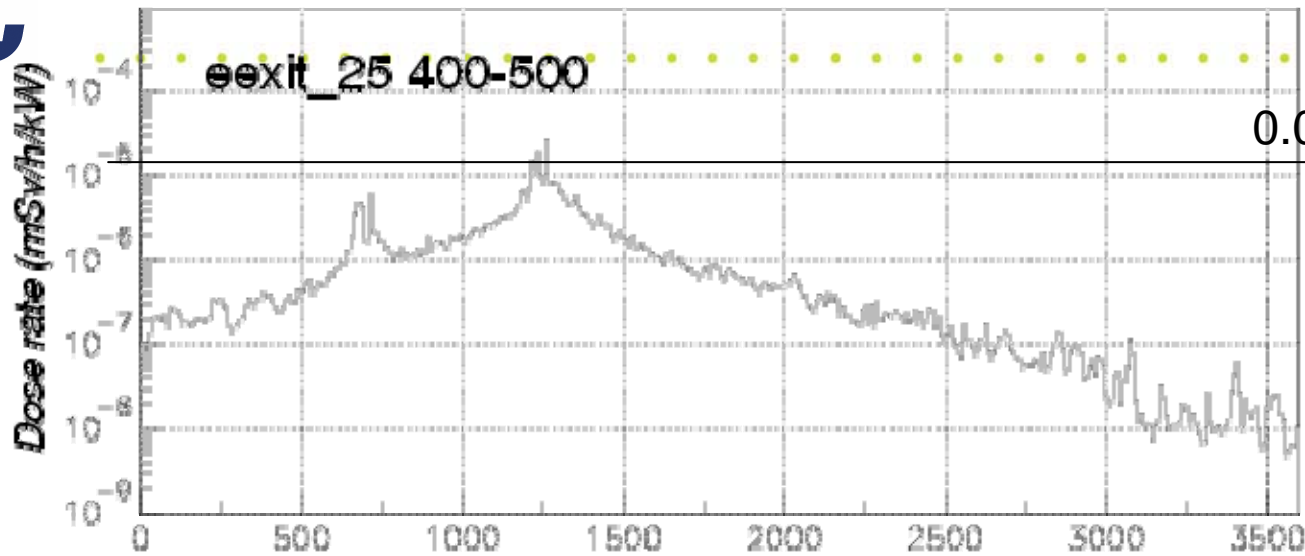
- We don't directly cost any components.
- Help other groups include features needed for commissioning, operations, and reliability.
- Will describe progress since Bangalore on that front



Exit passages between tunnels

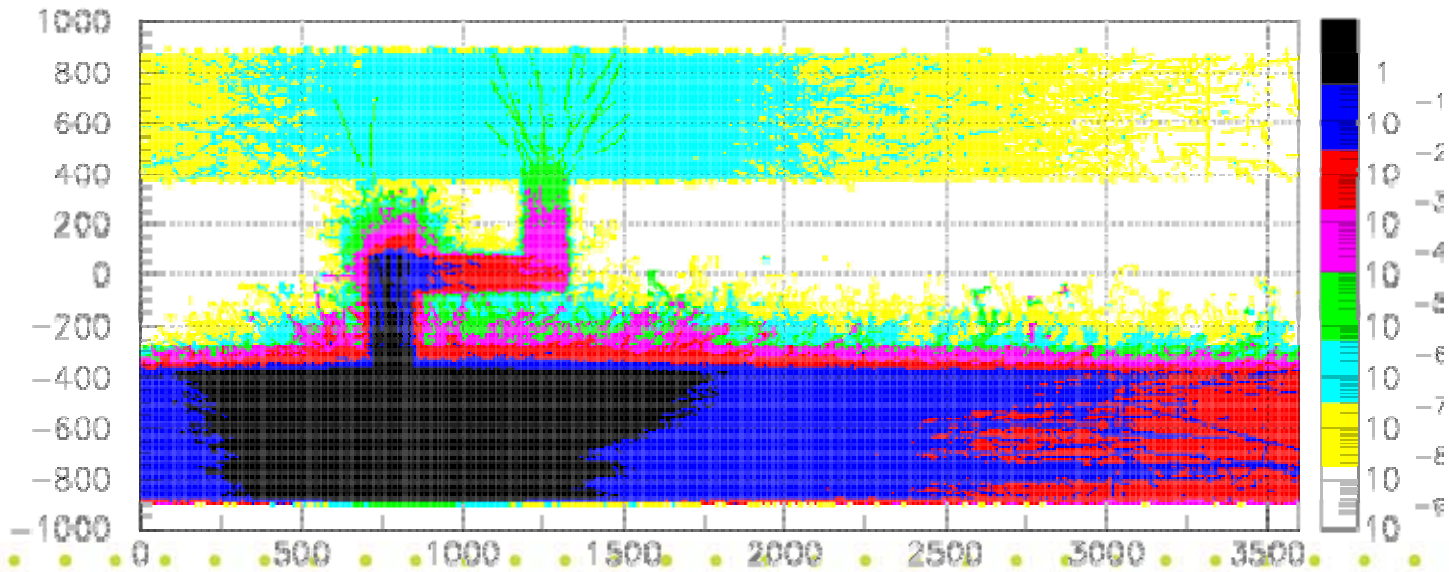
- Tried many designs to keep radiation in support tunnel below lowest region's limit of 0.014 mSv/hr/kW
- No heavy moving shielding doors
- 7.5 m between the tunnels
- Have found 2 designs that work

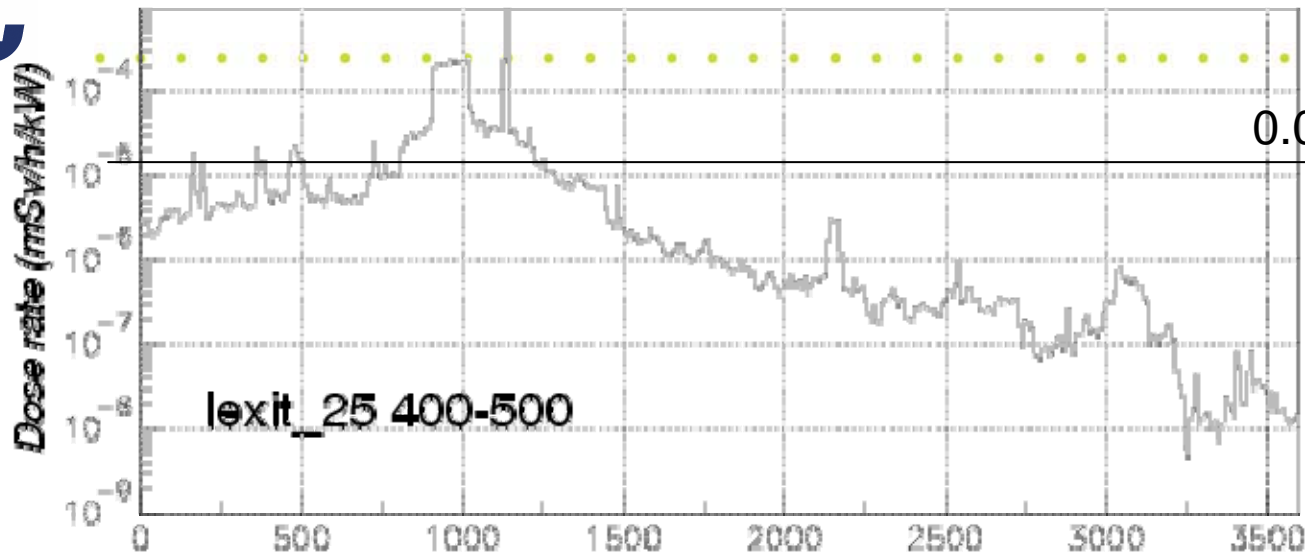




eexit_25 400-500

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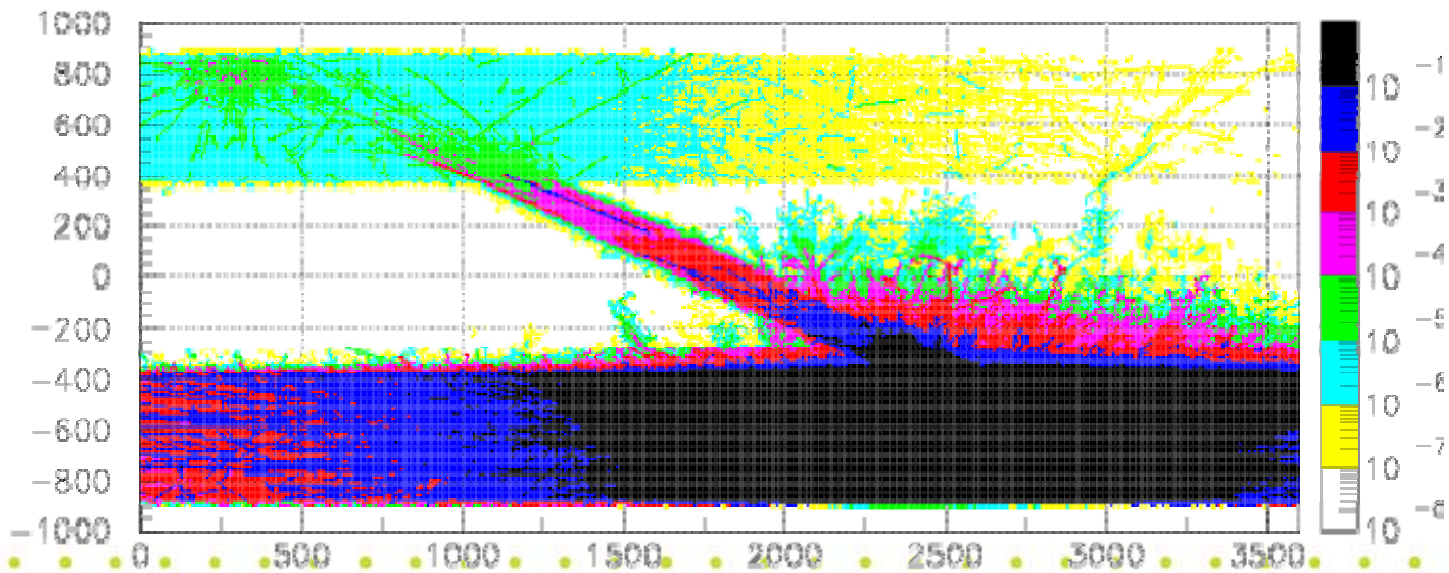




0.014mSv/kW

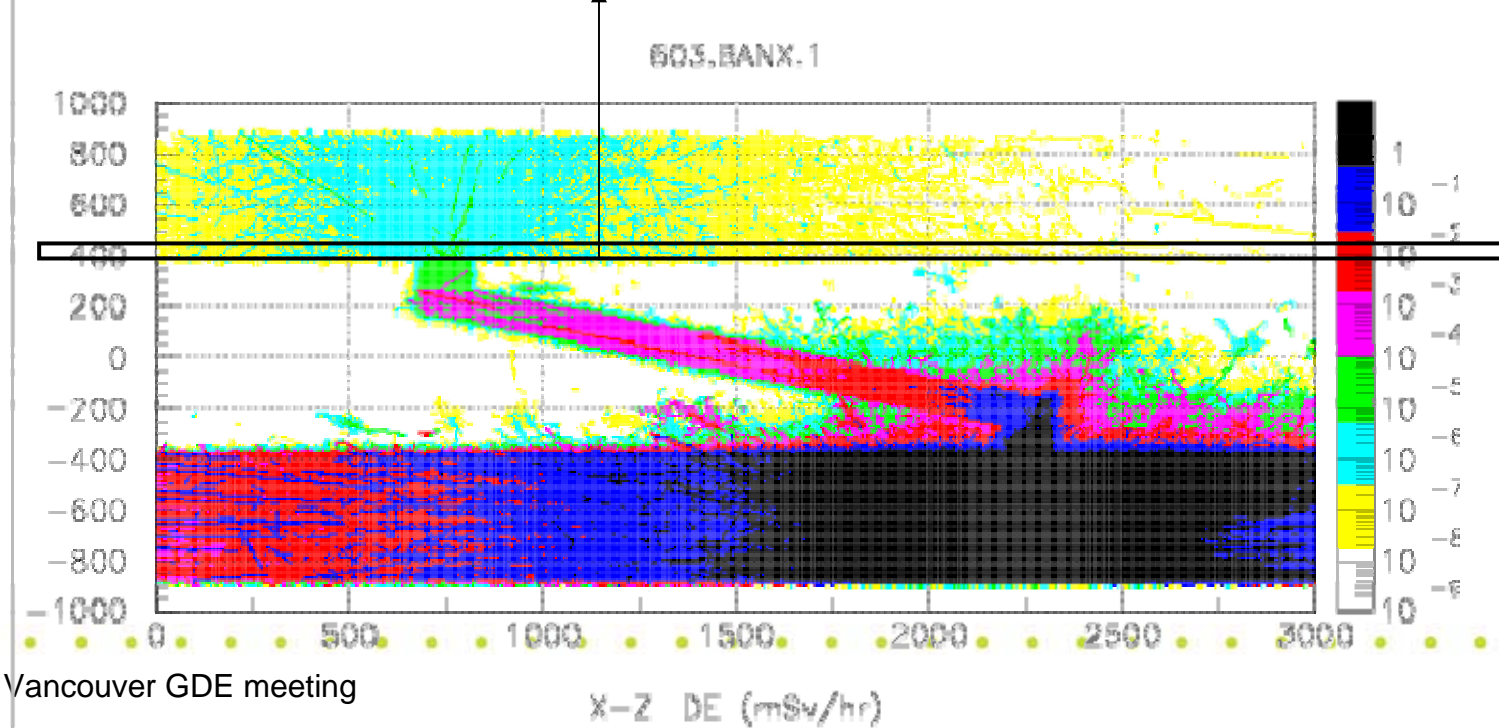
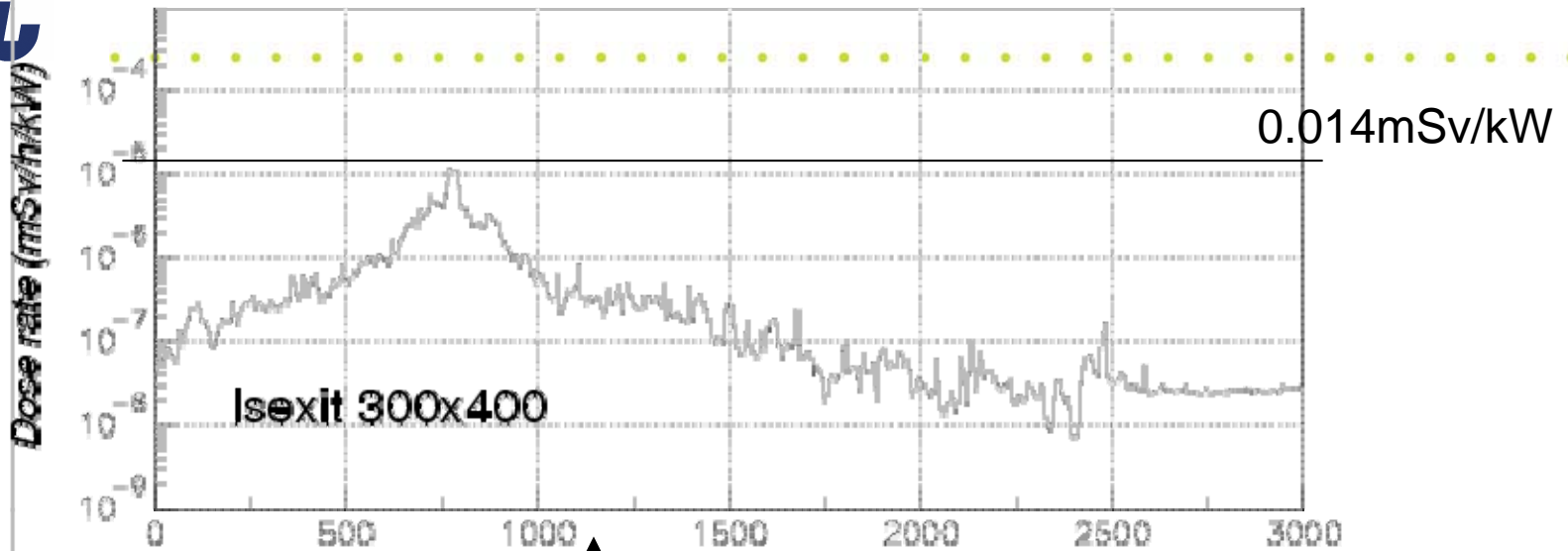
lexit_25 400-500

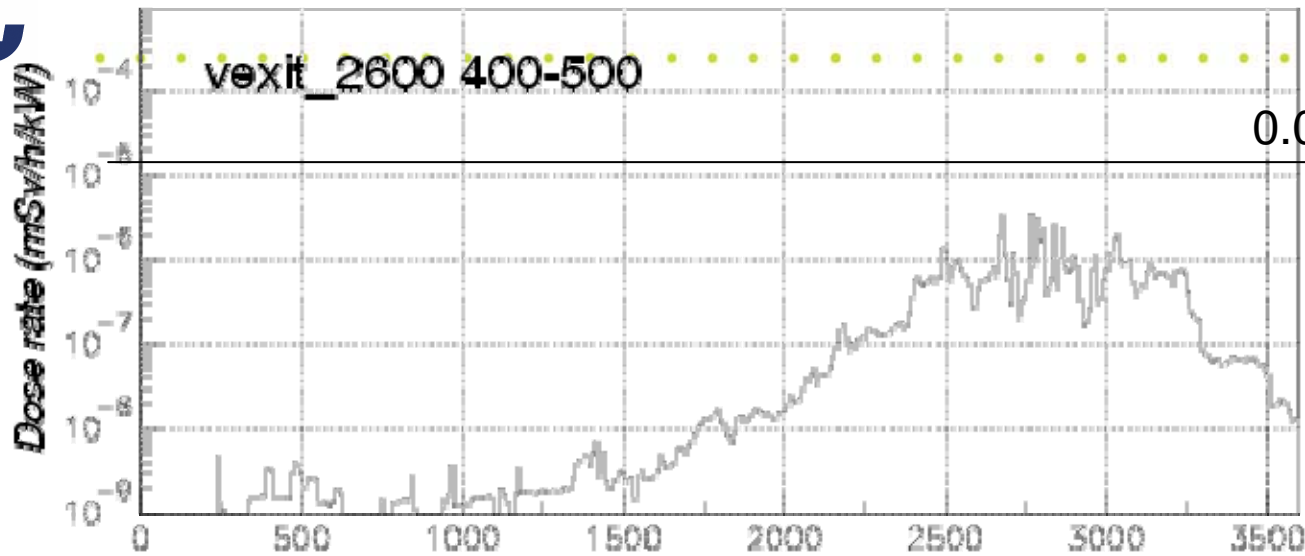
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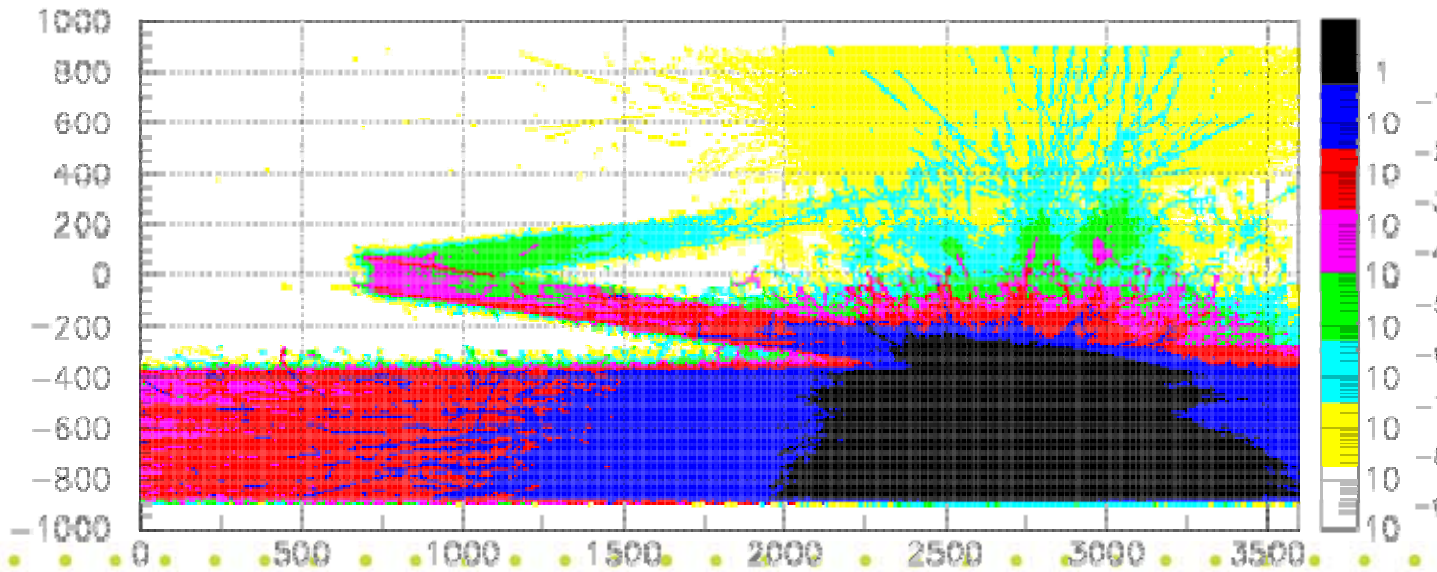
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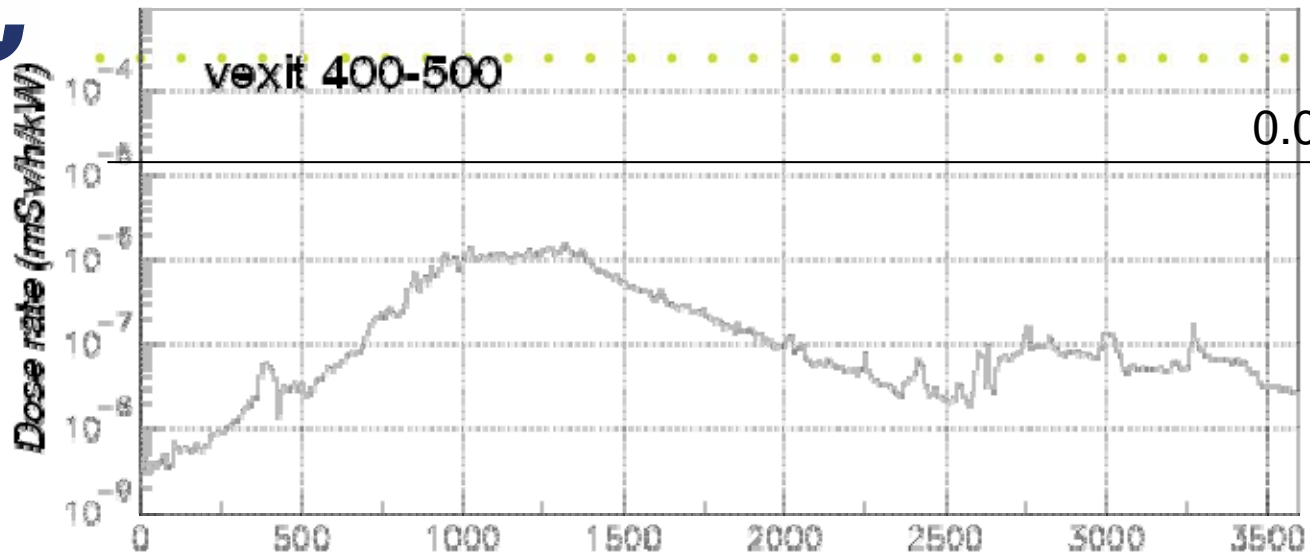




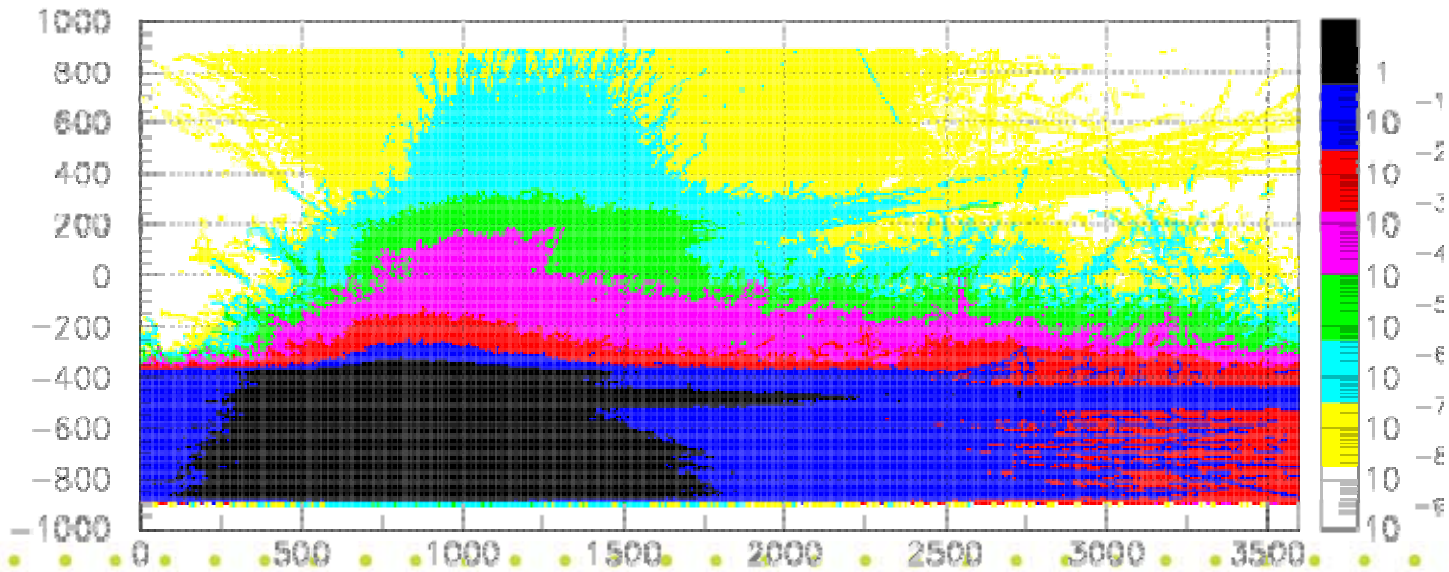
0.014mSv/kW

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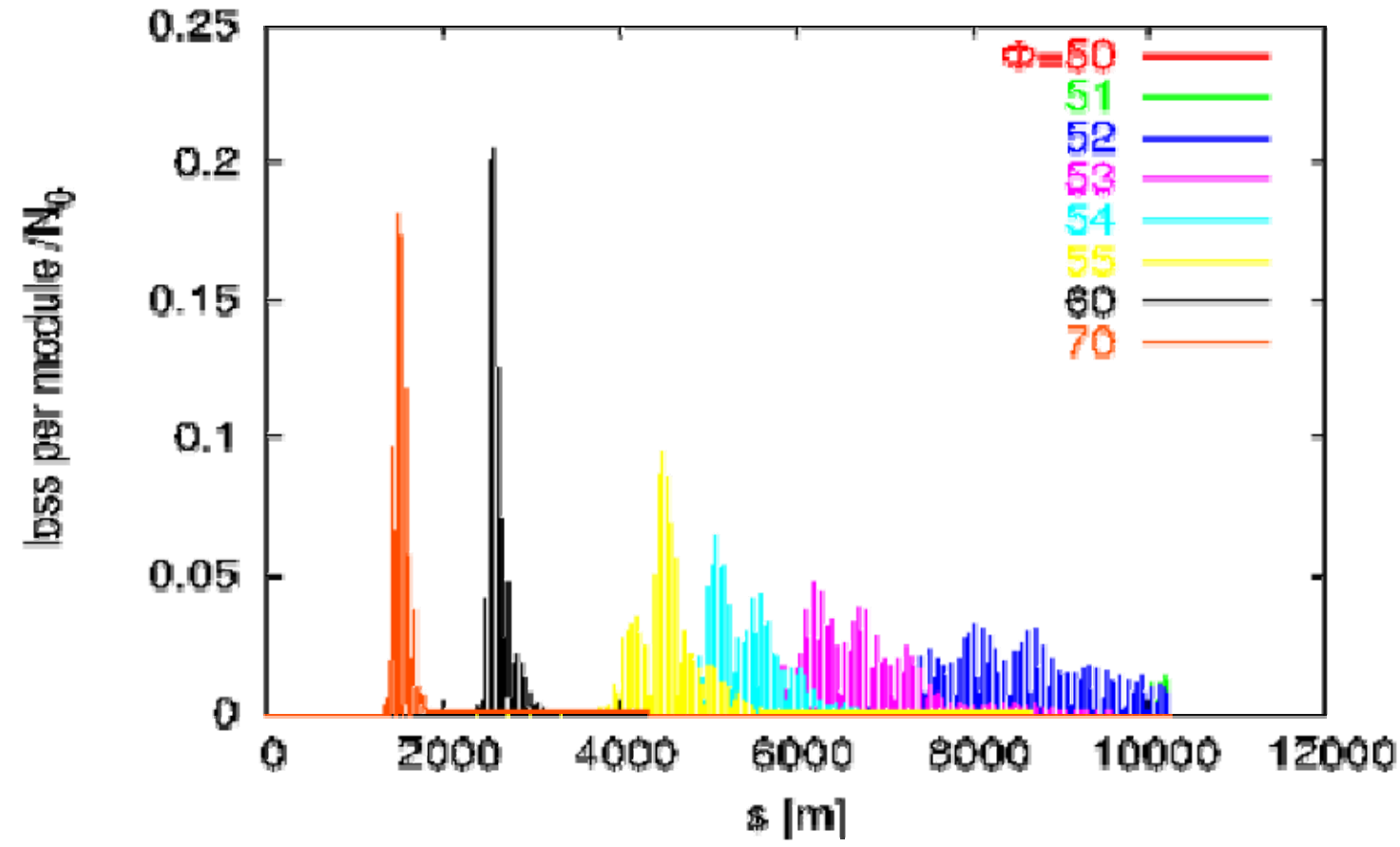


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MPS – Loss location for misphased klystrons

- One of several failure scenarios studied. More to do.





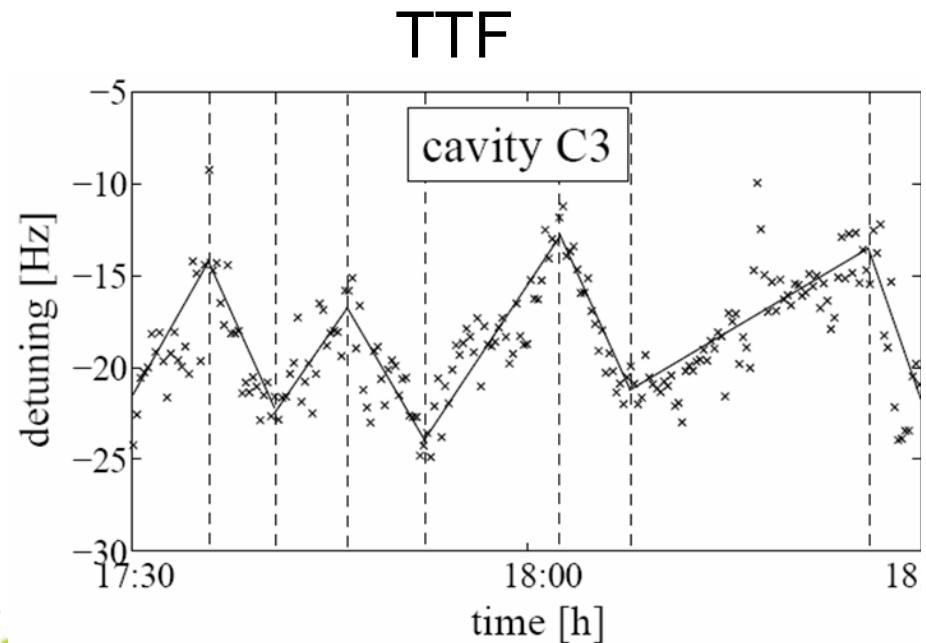
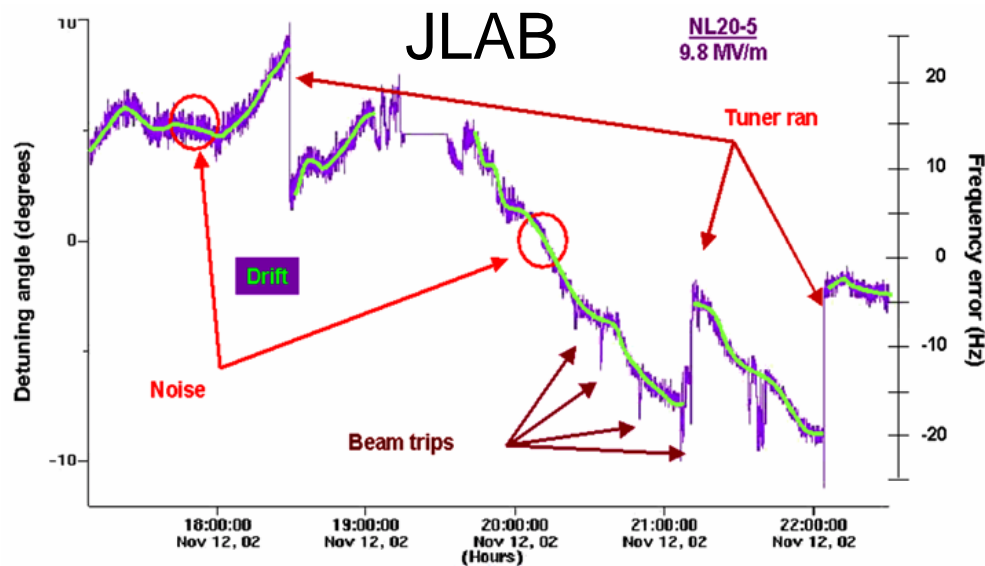
Availability update

- Did partial update of parts counts in availability simulation
- Many more magnets (esp in e+ transport line)
- 2 e+ DRs
- No power supply update
- Lost about 2% in integrated luminosity. Mainly from second e+ DR.



Cavity tuner motors –redundancy needed?

- New memo distributed:
 - http://www.linearcollider.org/wiki/lib/exe/fetch.php?cache=cache&media=rdr%3Ardr_gs%3Acavity_tuner_motor_availability.doc
- With 20,000 tuners and a 4 week MTTR this looked like a real problem.
- From JLAB and TTF data, cavities detune by ~10 Hz without active control. (Approx 3% in energy). Will use tuners or piezo to control this, but not major loss if some are broken.





Cavity tuner motors –redundancy needed?

- We don't have good figures for the MTBF of infrequently used cold stepping motors and mechanics.
- Uncertainties still remain.
 - **Have we missed some change in running condition which would require tuner motion?**
 - **Is it a problem not being able to detune a cavity when we want it off (low energy running) or when it has a quenching problem (will the equivalent of the 300kW input power go into the helium?)?**
- Having 20,000 devices which take a month to repair is a major problem unless they essentially never fail or their failure has virtually no effect on the ILC. We need to take great care to make sure they aren't a problem.



Extra costs for commissioning

- Items we have discussed, but not yet given to the area groups to have included in the costs.
 - **Transfer line to bypass the DR**
 - **Temporary shielding and dumps to commission one part of ILC while another is still under construction**
- We may decide these are needed and ask to have them added.
- Will try to keep the costs low.



Possible cost reductions

- These are possibilities, **NOT** recommendations
 - Lower average power requirements of dumps (Likely this is harmless)
 - 1 tunnel (with improvements to avail of other components) (still increases risk of poor availability)
 - Conventional positron source (would improve availability **and** be cheaper)
 - Give up RTML turn-around (requires confidence in low kicker jitter and no DR instabilities)



Work to be done before Valencia

- Define PPS zones in more detail and determine required shielding and stoppers
- better MPS definition
- availability tradeoff studies as requested
- pre-operations and operations costs
- commissioning requirements (transfer lines, temporary dumps, check that schedule is optimized for commissioning, ...)
- check if there are enough tuning elements and feedbacks and actuators and sensors