



Parallel Discussion: Scale-up Challenges

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Scale-up discussion topics.... infinite

- Electrical fields and Electrodes
- Purity
- Pile up
- Light detectors – large area
- Cosmogenic activation
- Management & engineering: From garage to large

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- 10% of the discussion
- 90% of the discussion

Electrical Fields and Electrodes

- Larger and larger TPCs will lead to the use of increasingly intense electric fields and electrodes with larger surfaces
 - ▶ big problem from the perspective of **spurious emission of electrons** from the electrodes
- Higher voltages lead to **electrical discharges** with increasingly macroscopic effects

Purity

- Spurious emissions of electrons is also related to **the impurities** of the noble target used
- This phenomenon **depends on the target**, argon or xenon, because of the different time constants and the different extraction efficiencies

Pile-up

- Having bigger and bigger detectors the probability of pile-up increases and this is one of the biggest problems of large detectors
- The **spurious emission of photons or electrons** is the primary cause of this issue

Proposed Solutions

- Better analysis tools to improve sensitivity, in parallel with the improvement of the photosensors, to detect and reject spurious electron emission
- Dedicated R&Ds are needed to study these phenomena



WAIT
WAIT
WAIT



Let's
make a
step-back

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Management & engineering: From garage to large

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- People are focused in scaling up the detector without focusing on the fundamental phenomena of the physics to reach those scales
 - ▶ We must have the control of the technology we are managing!
- This must occur even before to start the final experiment
- It is hard to scale up and keep going with R&Ds to understand things

Management & engineering: From garage to large

Talking about solutions

- the interaction among experiments is fundamental, not only when a conference takes place, not even by email
 - ▶ a kind of free forum would be a good solution, the perfect place where we can open a topic and discuss it
- it is important to use the conferences to interact more:
the goal of the conferences is not only showing the mechanisms of the various experiment, but also and mostly to connect people from different experiments in the way they cooperate to solve common issues

Management & engineering: From garage to large

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Talking about solutions

- maybe **the format of the actual conferences must change** giving more space for free discussions, choosing some open topics that constitute common issues that we want to discuss together
- each conference must give an input for the next one
- one of the main problems is the **management of the problems**
 - ▶ it is important to drive a discussion in a precise direction, topic by topic, without generalizing

Conclusions

- Make a LIDINE report that will work as input for the next LIDINE, also mentioning technical aspects
- Write a document, a report, to be put in arxiv where all the issues are mentioned. Everybody should be able to access it and edit it
- Open a forum where the community can constantly stay in touch