

# Super*B* Simulations with Geant4

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*for*  
*the background team*



# Talk Outline

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- *Present status*
- *Short term goals (Paris & Mini-MAC)*
- *Some considerations*
- *Longer term goals*



# Present Status (Good news!)

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- *Andrea di Simone joined the team!*
  - *New ideas to overcome the GDML limitations*
- *Bruno is available from SVN (Padova)*
- *Mauro Munerato built and ran Bruno*
- *Roberto Stroili ported the Xrootd writer on Bruno*



# Present status (Unpleasant news)

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- *Lot of harmless (more or less) warnings*
- *“Double free” on Bruno exit*
- *Documentation still missing*



# Present Status (Sad news...)

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- *The main developer, Giovanni, went in Paris...not to attend the SuperB meeting (who will take care of SVT & Beam lines?)*
- *We did not produced nor analyzed the bigger background sample we proposed by ourselves in Elba.*



# Short term goals (February)

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- *Production of the bigger background sample (end of January)*
  - *Parasitic use of the Padova farm (Roberto Stroili)*
- *Rates, doses, impact of performances to be evaluated and reported at the Paris Meeting and reviewed for the Mini-MAC*



# Longer term goals

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- *Monte Carlo truth information*
- *pyBruno: a Python interface for Bruno*  
*(Andrea di Simone)*
  - *or: “How to specify at run time what is now specified at compilation time”*
- *Shorter development cycle*
- *Easiest learning path for the user*  
*(Who are the users?)*



# Longer term goals II

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- *Fast simulation geometry and “effective” parameters from Bruno*
- *GHits digitization*
- *Backgrounds digi injected in fast simulation*



# Background Analysis

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- *A Background analysis task is not an analysis task put in background.*
- *Backgrounds from PEP-II were not completely understood even after years of studies of dedicated people.*
- *Geant4 cannot be the source of wisdom: you have to know how the machine works what Bruno does and use your judgement.*



# Background Analysis

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- *Various new interactions regions designed by Mike Sullivan*
  - *Short PM Quad on the LER, then SC Quads on LER & HER*
  - *To be translated in GDML (who?)*



*Antisolenoid* →

*Cryostat* →

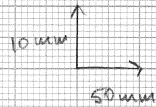
*QDOL*

*LER* →

*QDO*

*QF1* ↗

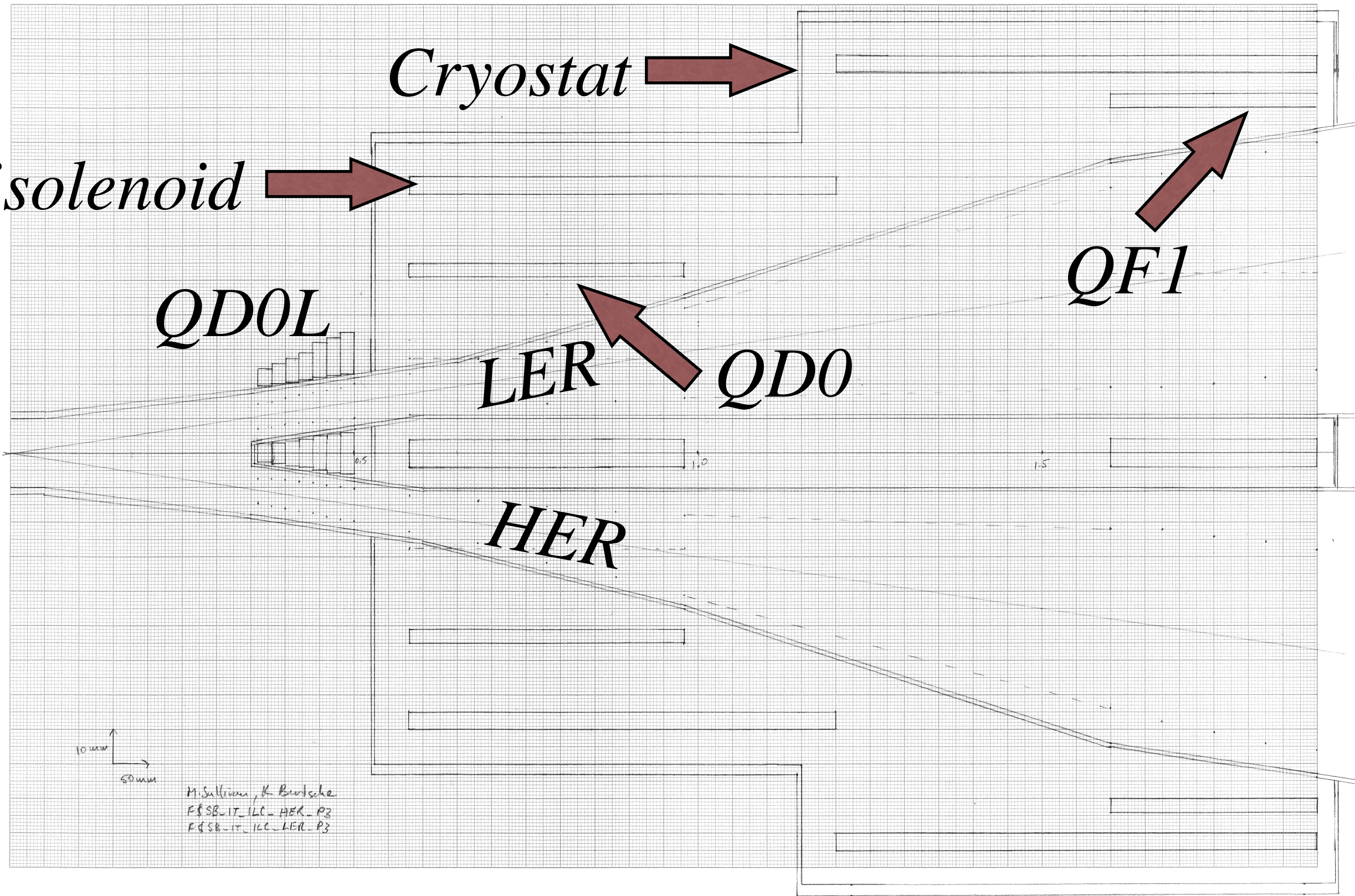
*HER*



M. Sullivan, K. Bartsche  
F&SB-IT-ILC-HER-P3  
F&SB-IT-ILC-LER-P3

47 1510

K&E 10 X 10 TO THE CENTIMETER #25 X 38 CM.  
KEUFFEL & ESSER CO. MADE IN U.S.A.





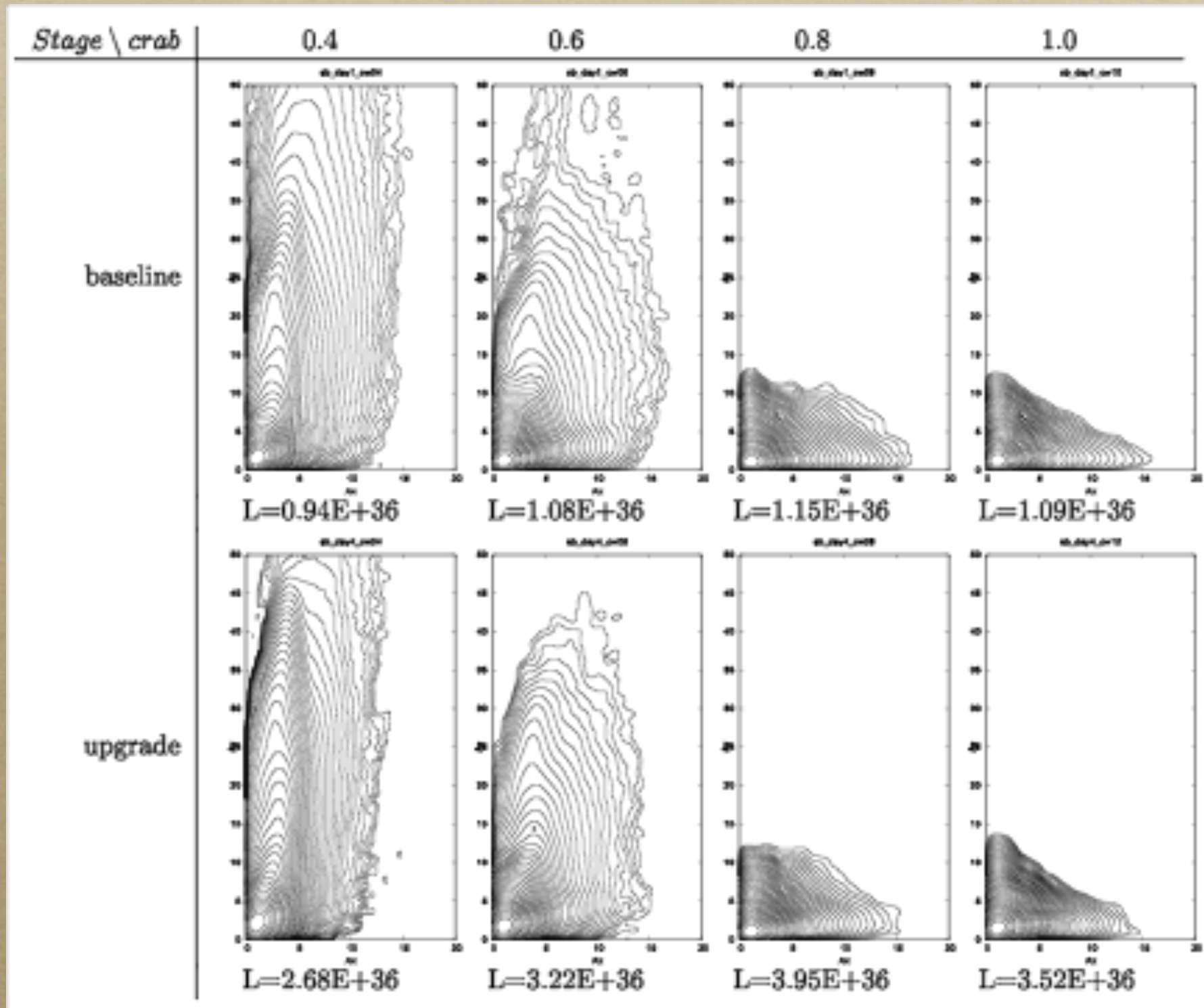
# Backgrounds sources

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- *Single beam backgrounds by Manuela Boscolo (What generator? Turtle?)*
- *Beam halo (Lifetrack?)*
- *Injection backgrounds (?)*
- *Catastrophic events (??)*



# Beam halo





# Conclusions

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- *Bruno is in fairly good shape*
- *The development path is sketched*
- *Still missing some background generators*
- *Lot of work to do in less than 2 months*
- *Conclusions will be reported at the end of the meeting.*