

Uppsala Point Source Search in 99 data: Status.

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- The Overlap Integral
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- hopefully Near Future.

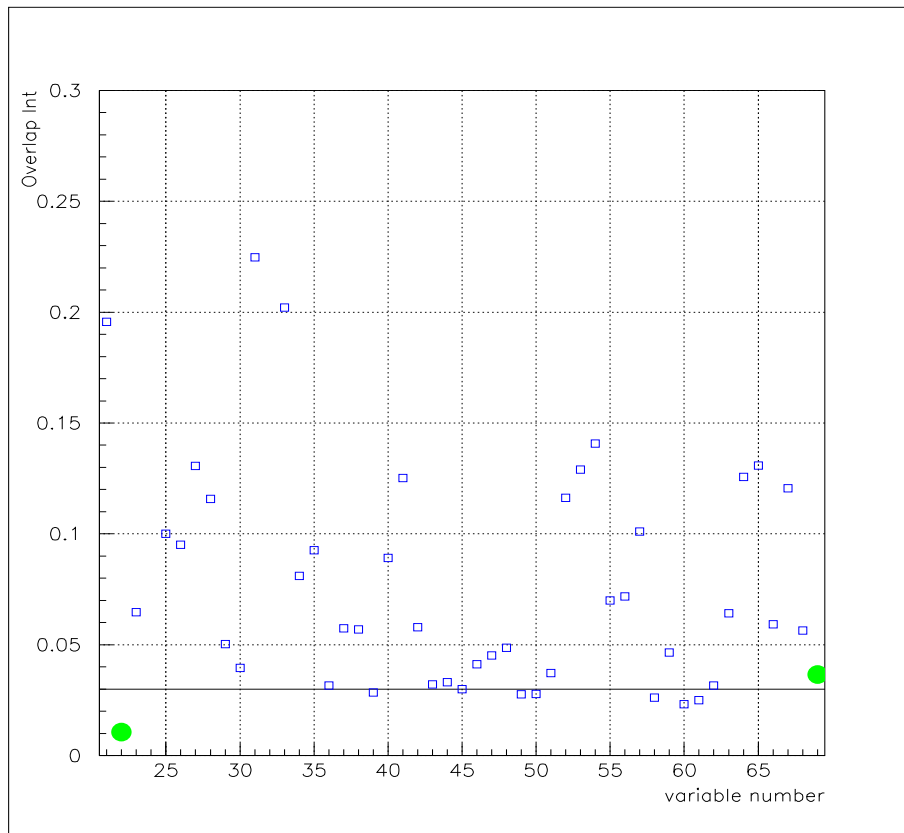
The Overlap Integral

- The Point Source Analysis has experienced several iterations, and different approaches (Kim, Young, Biron)
→ Calculate overlap integral for variable z :

$$I = \int f_{MC}(z) f_{Data}(z) dz \quad (1)$$

Variable with smallest overlap integral best suited for rejection.

The Uppsala Filter



Variables for filter:

- ◇ zenith angle of the muon reco(4)
- ◇ smootallrl(4) (all hits, maximum reasonable length)
- ◇ jkrchi(5)/jkrchi(4) (ration of cascade/muon fit)

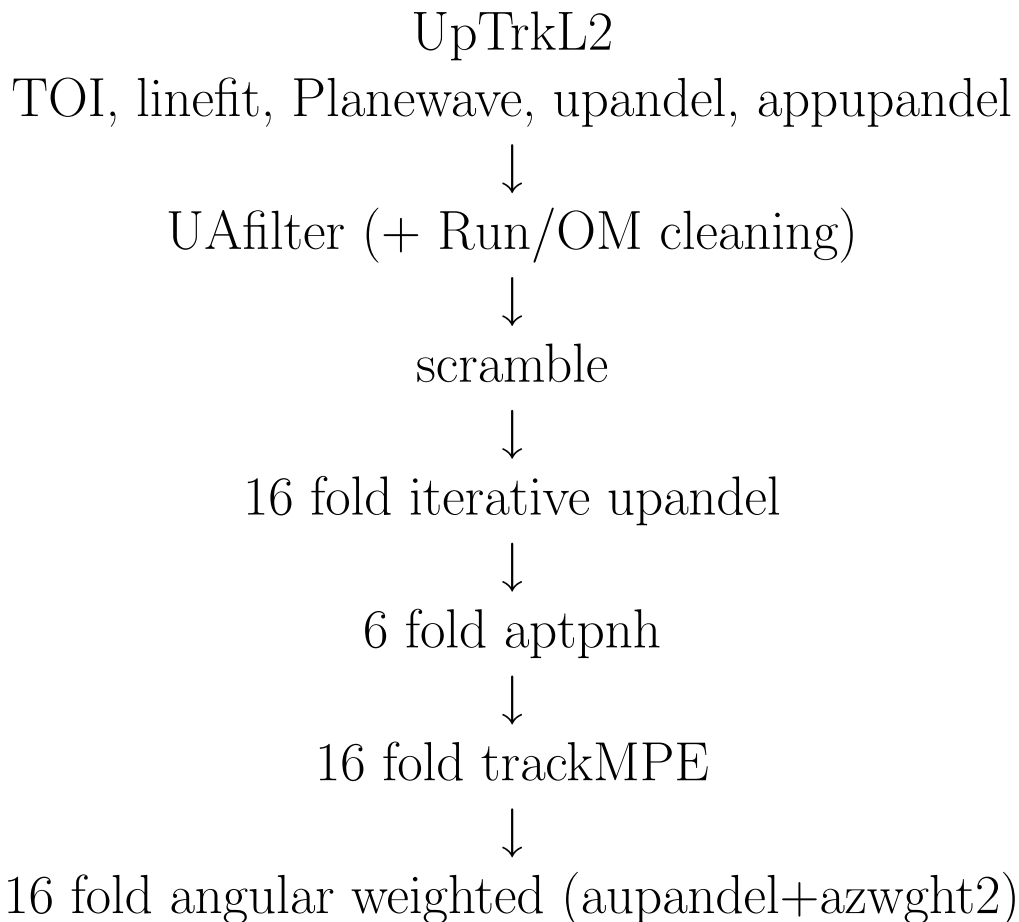
The Data

◇ Data Sets:

Data: Level 2 99 filtering (UpTrkL2)

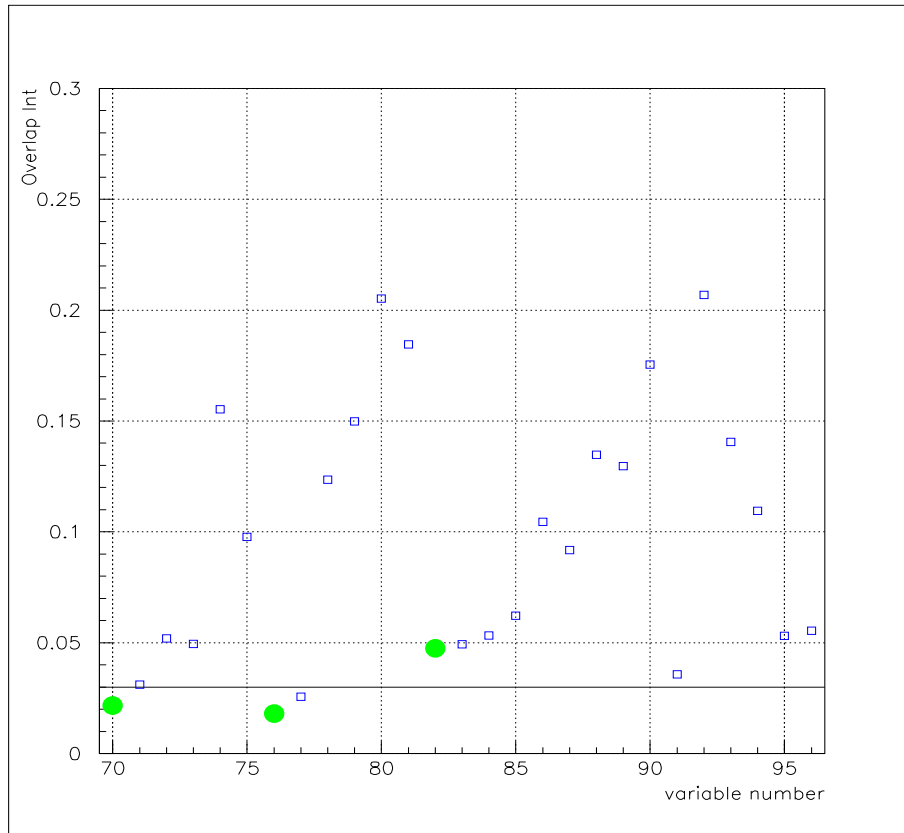
MC : nusim level 2, MAM, E^{-2} spectrum
thanks Peter N.

◇ Data Processing:



plus Hesse matrix info (Tonio)

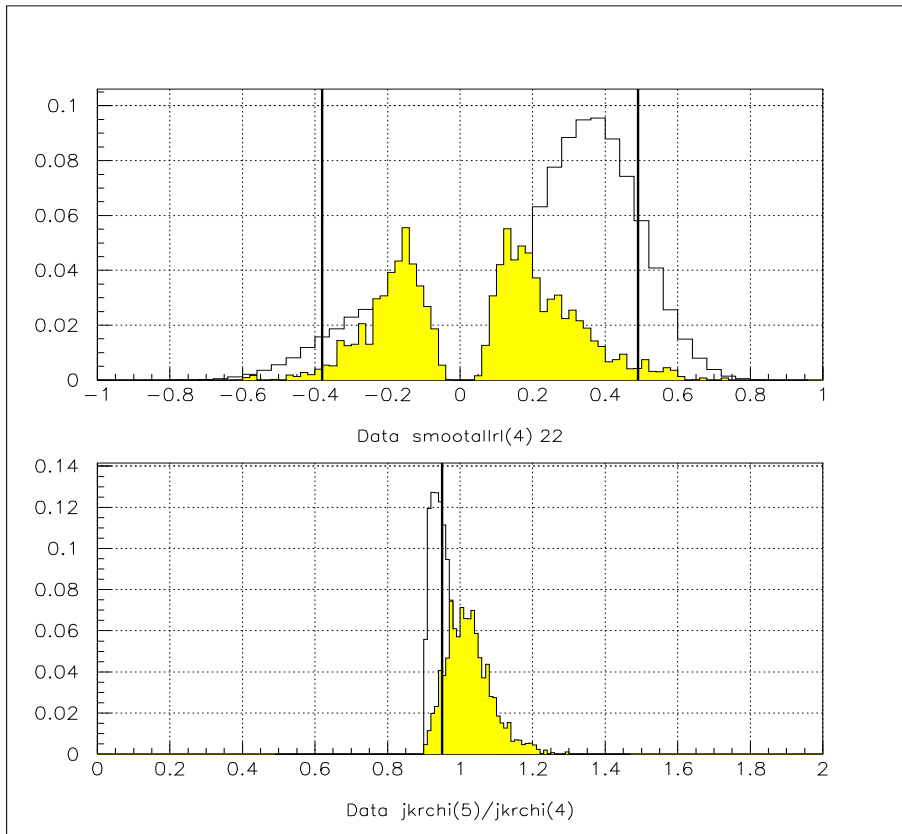
Overlap integral again.



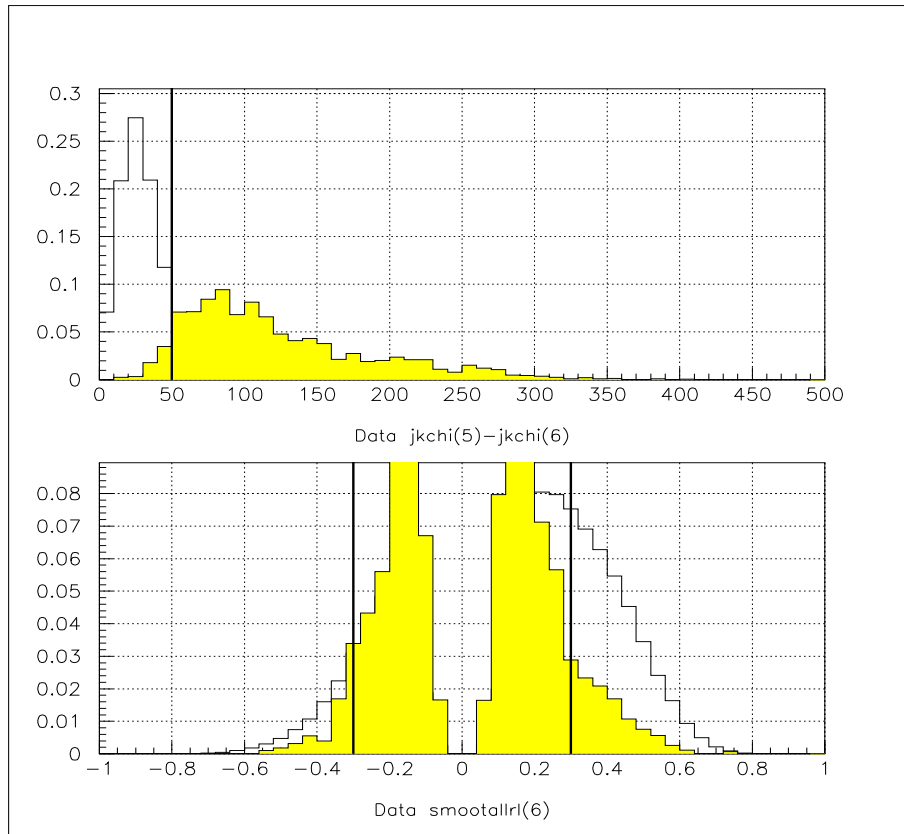
New Variables :

- ◇ zenith angle of the weighted muon reco
- ◇ $jkchi(5) - jkchi(6)$ (cascade - 16 fold iterative)
- ◇ smoothallrl of 16 fold iterative muon reco

Filter variables.



More ...



The angles.

Cummulative Passing Rates: First Shot (non optimized)

Cut level	E-2 signal	Data
UpTrkl2	1	1
UFilter	0.90	0.4
zenith(9)	0.54	0.03
jkchi(5)-jkchi(6)	0.52	1.6e-3
smoothness(6)	0.42 (0.18)	6.7e-4 (1.3e-5)
UCIfilter	0.54	0.03
UCI all cuts	0.12	8e-7

What next ?

- ◇ xt-cleaning.
- ◇ low level checks.
- ◇ do an optimization of the overlap integral
- ◇ do cut value optimization
- ◇ try out multivariate method
 - Support Vector Machines,
 - Discriminant methods, NN ...
- ◇ etc. etc.