INTRODUCTION

Light gluino search

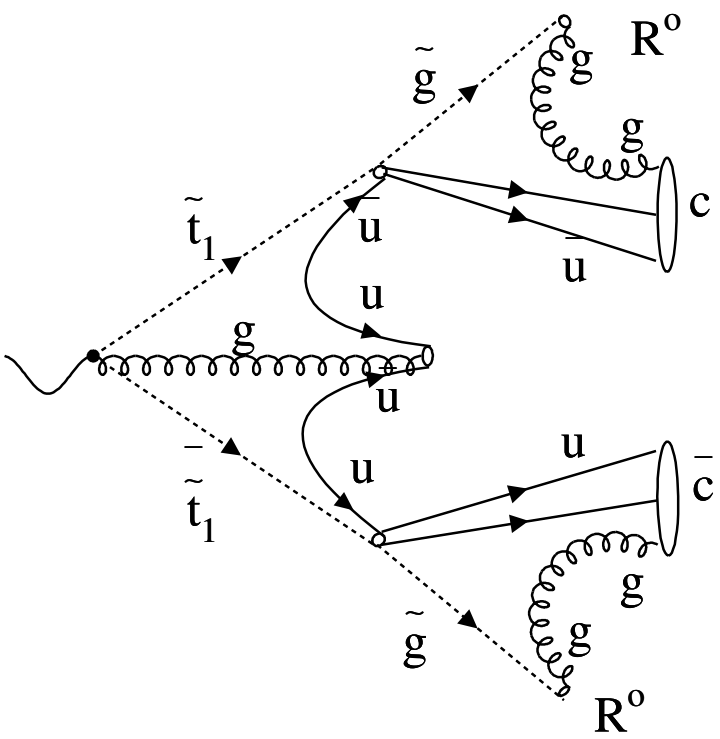
$\tilde{t}_1 \rightarrow c\tilde{g}$

- Simulation status
- Charged Rhadrons ($R^{\pm}$) : Sequential analysis
- DATA Monte-Carlo Comparison at 192, 196, 200, 202 GeV
- Preliminary results

Stop generator : STOPGEN

The gluino can fragment into :

- Charged R-hadrons : $R^{\pm}$
- Neutral R-hadrons : R^{o}
- (Branching ratios are unknown)



Rhadrons do not deposit all their energy into the hadronic calorimeters

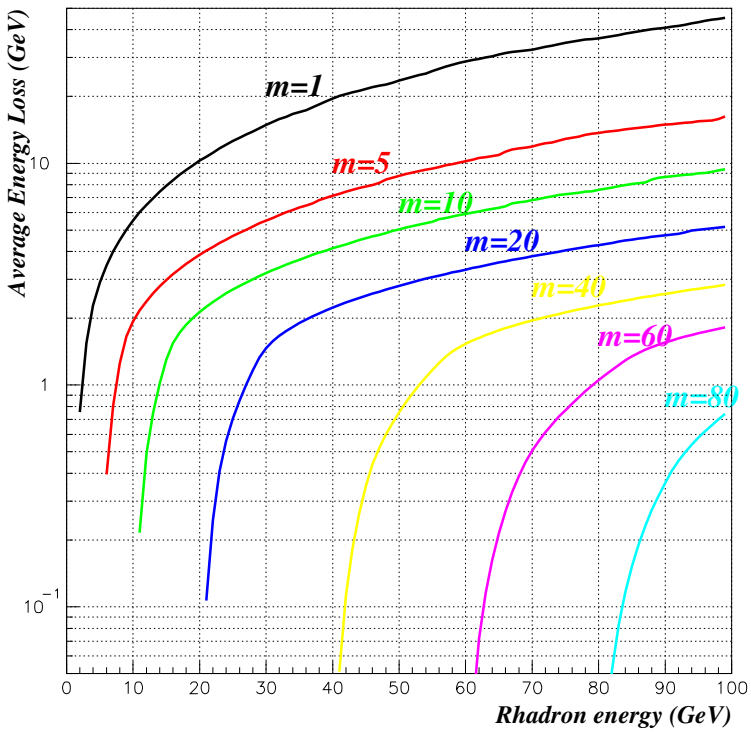
Simulation status

Rhadron simulation :

They are treated in DELSIM as :

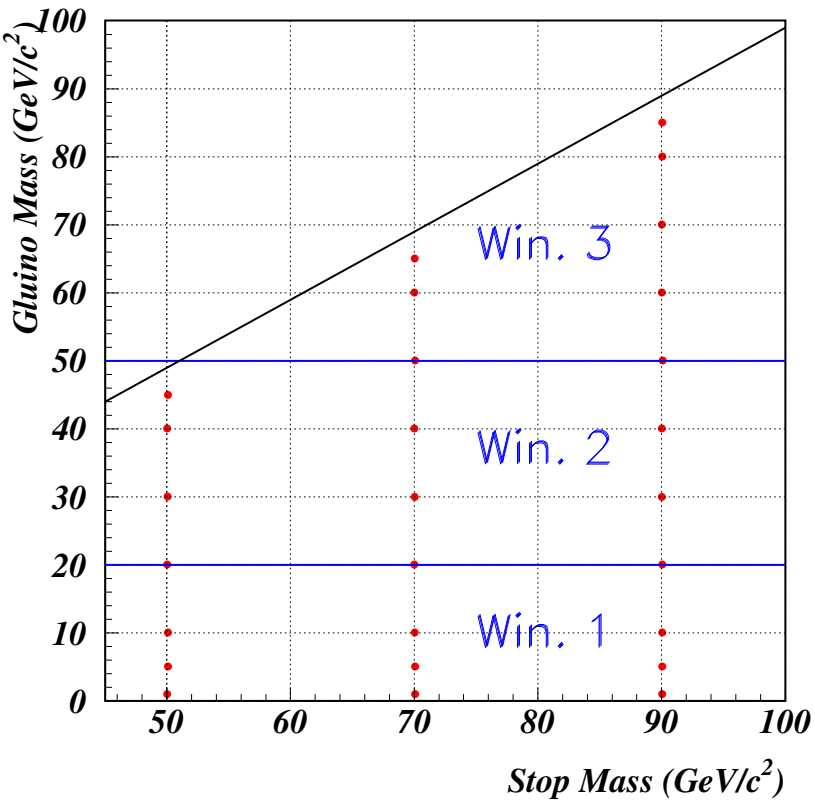
- Heavy muons : $R^{\pm}$
- k_L^o : R^o

The average energy loss of the R^o is estimated using a cross-section model and this energy is given to the k_L^o.



Simulation status :

500 events have been generated with DELSIM+DELANA for both cases: $R^{\pm}$, R^{o}



$R^{\pm}$ Analysis

DST analysis

- **SKELANA 2.0**
- **no REMCLU information**

Preselection 1

- **at least 1 particle with** $P_t > 1.5$
- $E_t \geq 4$
- **at least 6 charged particles**

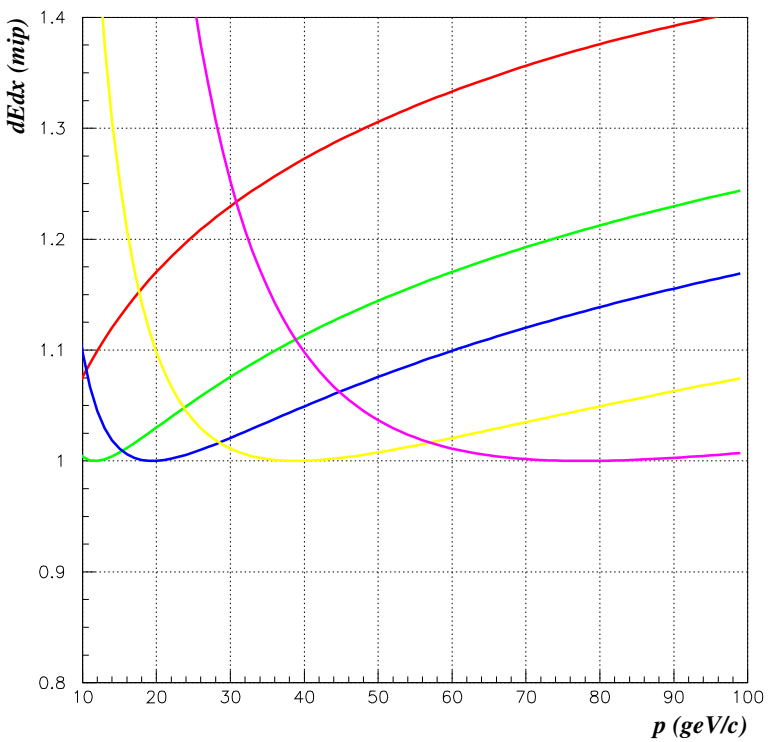
Preselection 2

- **at least 10 GeV in each hemisphere of DELPHI**
- **at least 2 "heavy" charged particles:**
  - **with** $P > 10$ **GeV**
  - **reconstructing with TPC info**
  - **with** $\cos(\theta) \leq 0.8$

$R^{\pm}$ Analysis

Window 1 : $M_{\tilde{g}} \leq 20$

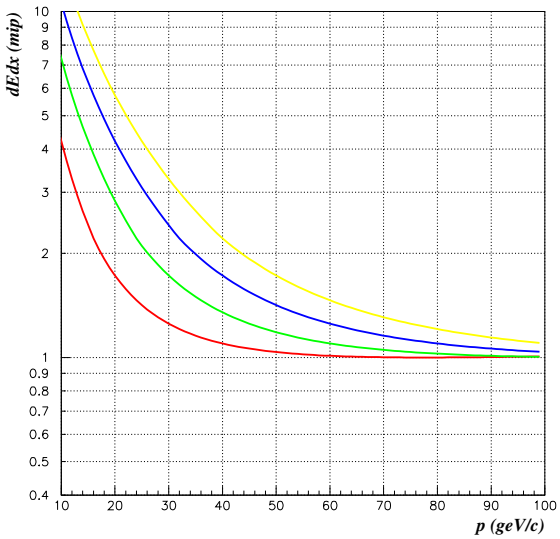
- **at least 2 "heavy" charged particles with** $P > 15$ **GeV**
- $\sqrt{s'}/\sqrt{s} > 0.7$
- $-\log(y4) \leq 2.5$
- **at least 1 "heavy" charged particle" low dedx tagged**

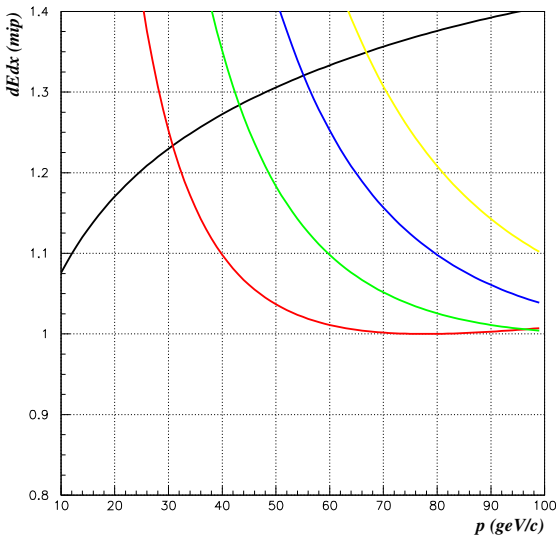


$R^{\pm}$ Analysis

Window 2 : $20 < M_{\tilde{g}} < 50$

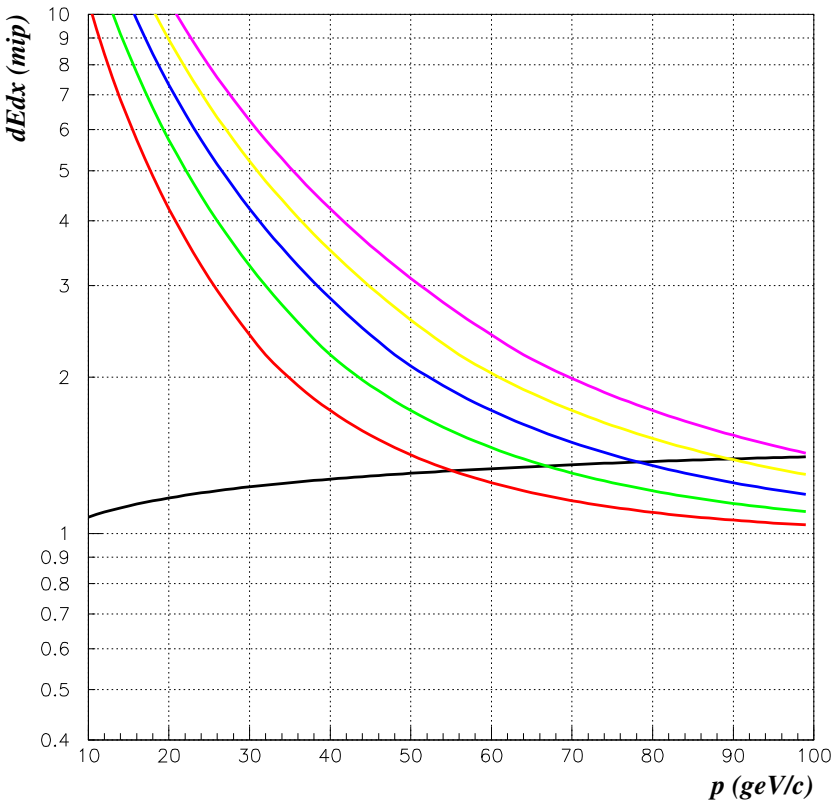
- **at least 1 "heavy" charged particles with** $P > 30$ **GeV**
- $E_{HPC} + E_{EMF} + E_{STIC} < 30.$
- $\sqrt{s'}/\sqrt{s} > 0.8$
- **at least 1 "heavy" charged particle" low dedx tagged "OR" high dedx tagged**



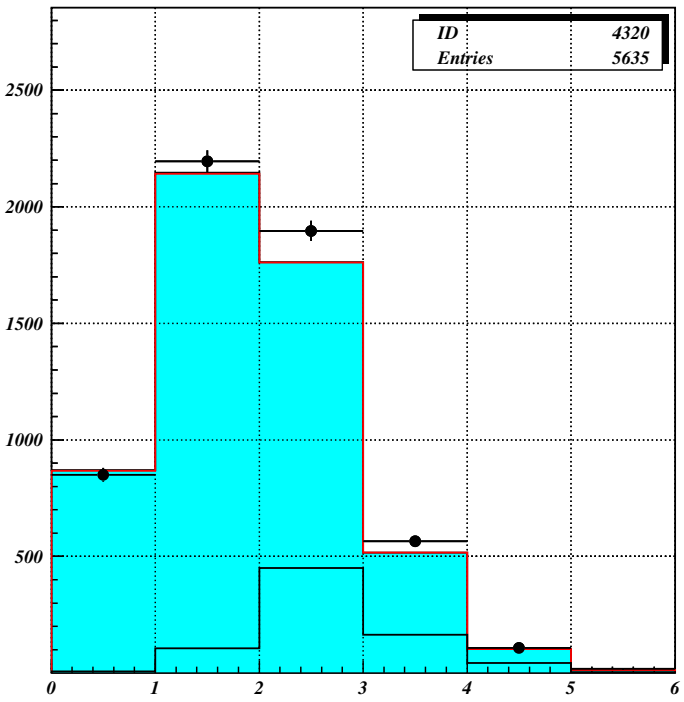


Window 3 : $M_{\tilde{g}} \geq 50$

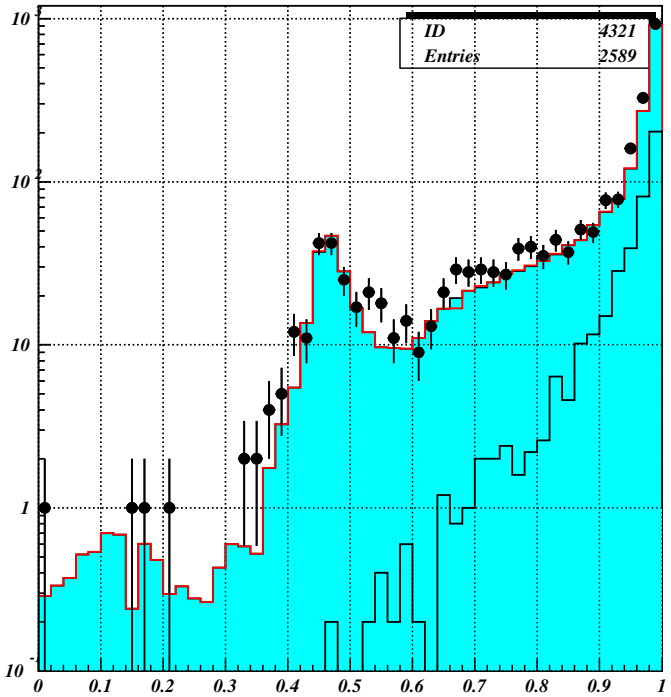
- $E_{HPC} + E_{EMF} + E_{STIC} < 30.$
- **at least 2 "heavy" charged particle" high dedx tagged**



$R^{\pm}$ Analysis : window 1

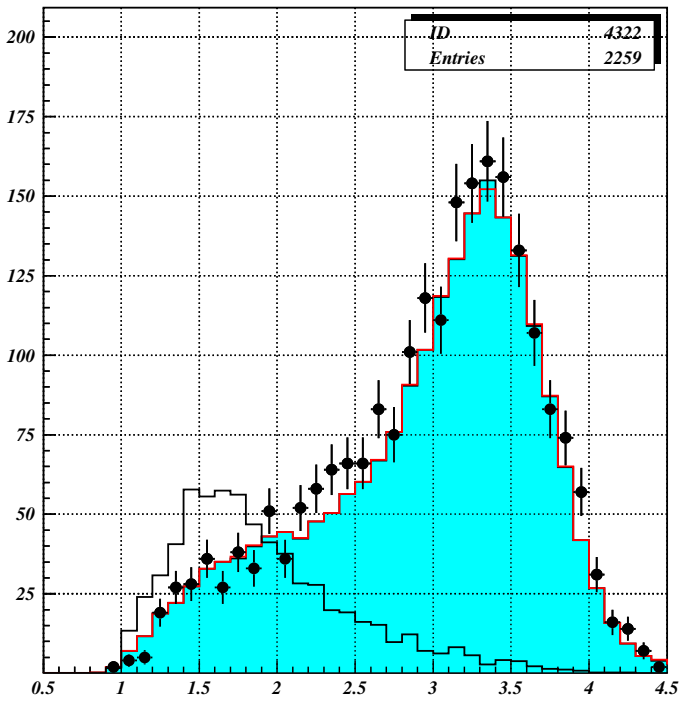


cut 1 (2) : N p.gt.15

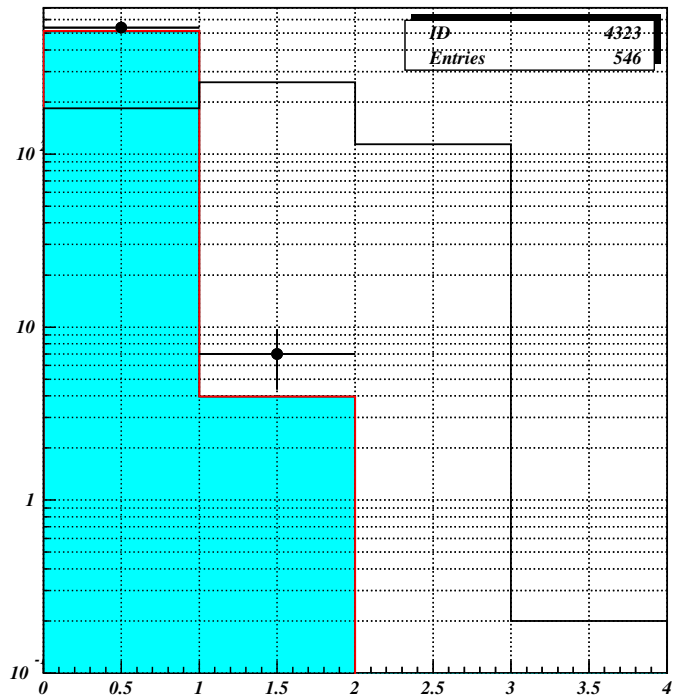


cut 2 (2) : sprim/ecent

$R^{\pm}$ Analysis : window 1

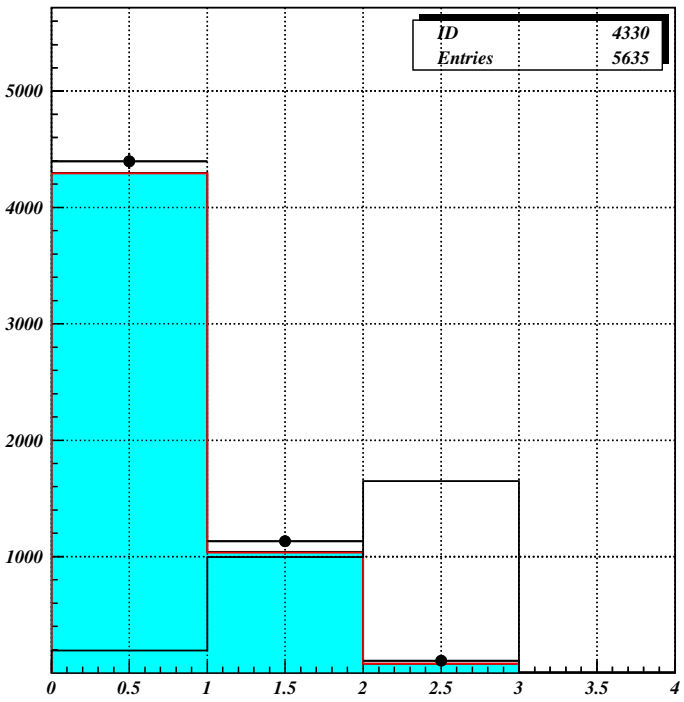


cut 3 (2) : -LOG10(Y4)

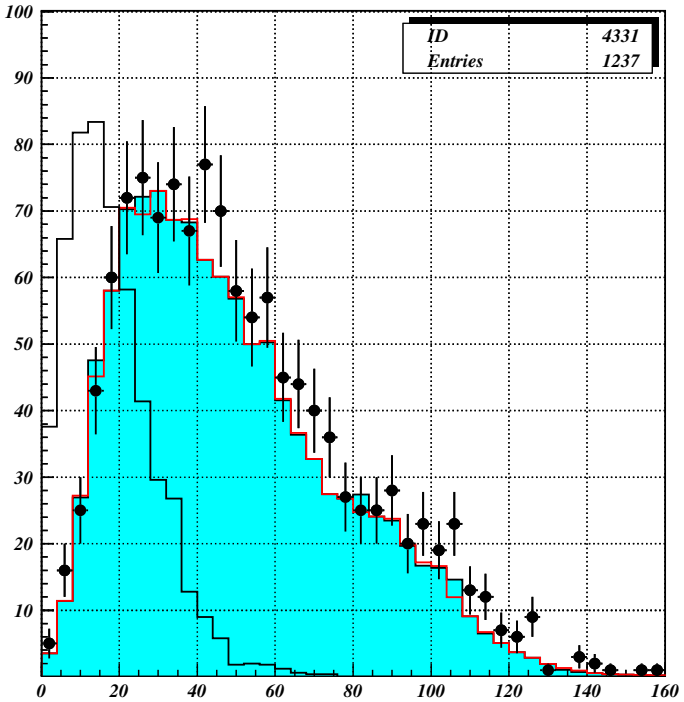


cut 4 (2) : N heavy tracks

$R^{\pm}$ Analysis : window 2

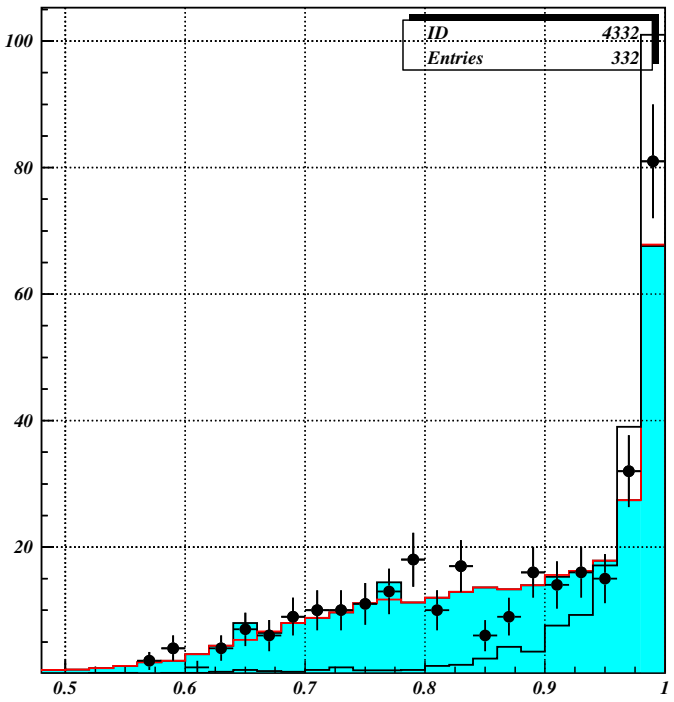


cut 1 (3) : N p.gt.30

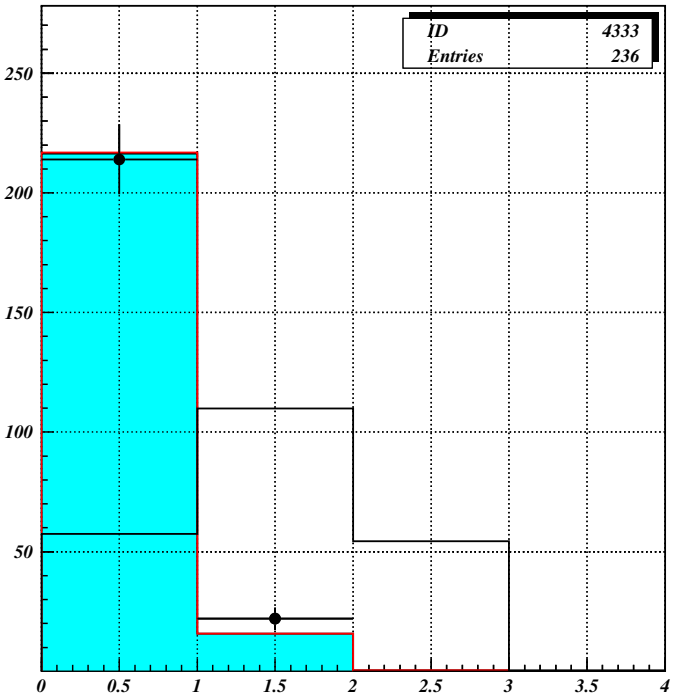


cut 2 (3) : Eelectromagnetic

$R^{\pm}$ Analysis : window 2

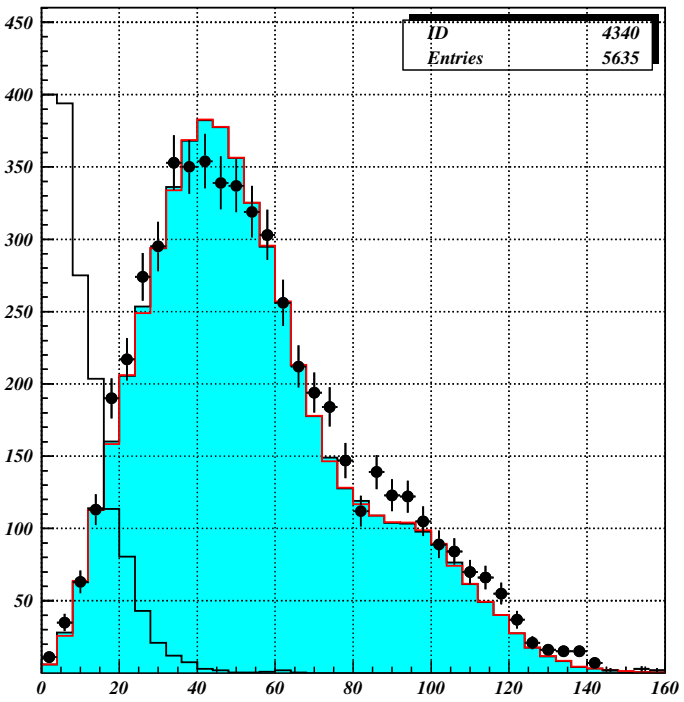


cut 3 (3) : sprim/ecent

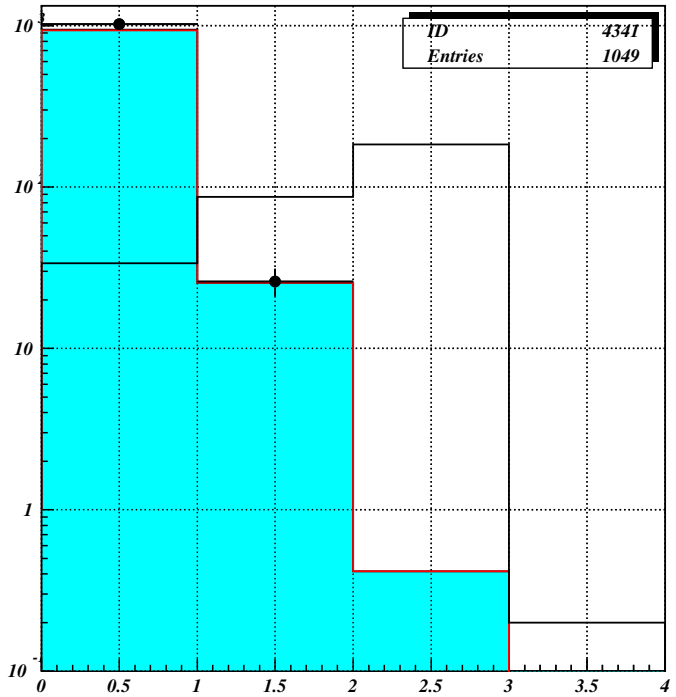


cut 4 (3) : N heavy tracks

$R^{\pm}$ Analysis : window 3



cut 1 (4) : Eelectromagnetic

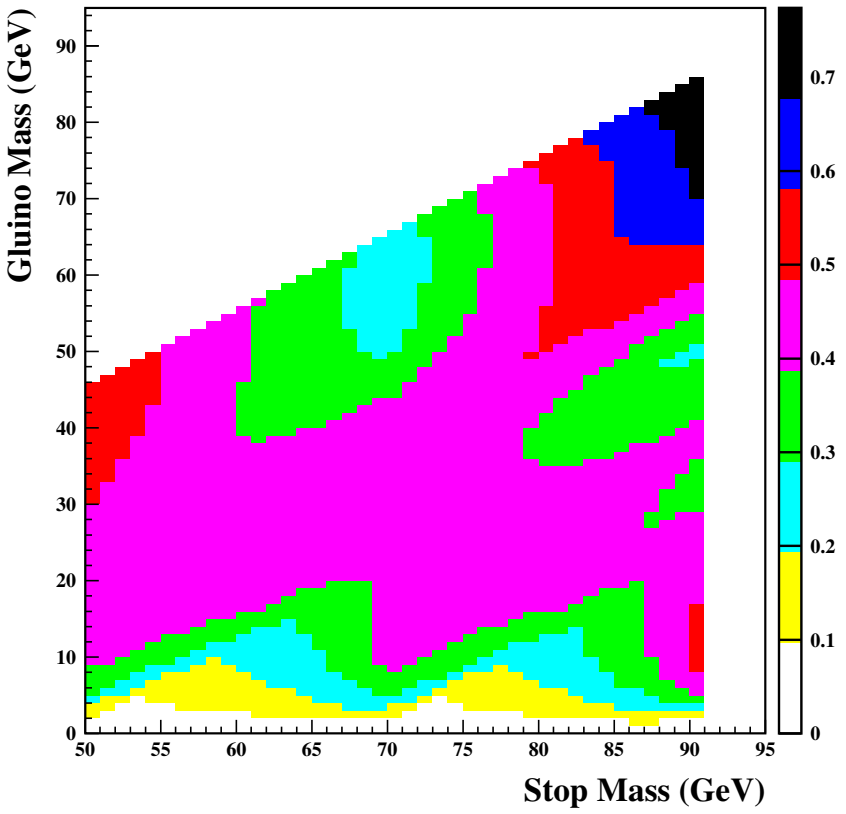


cut 2 (4) : N heavy tracks

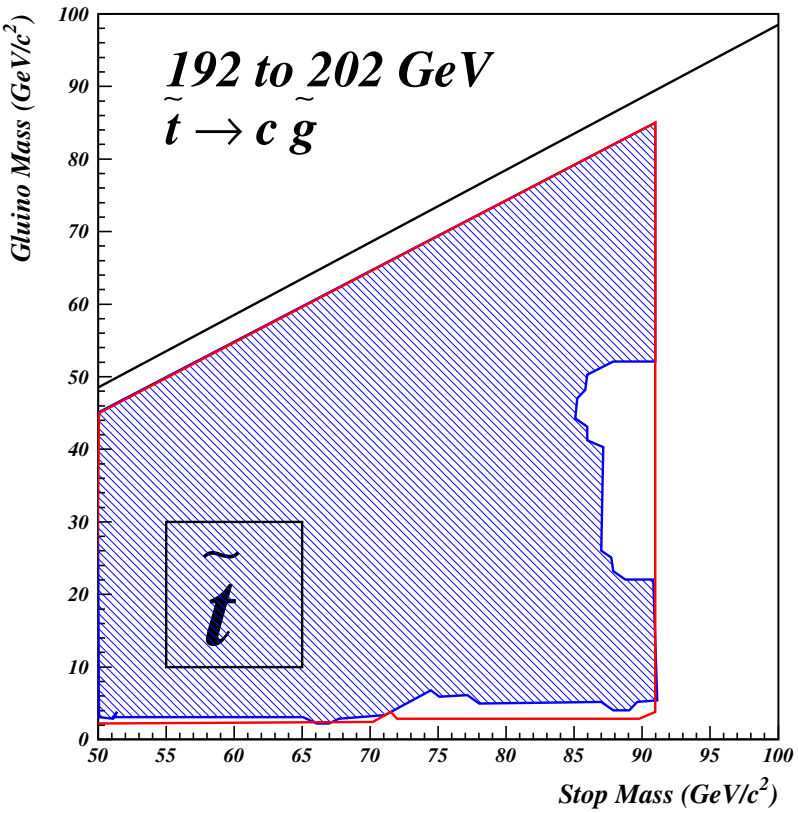
Results

	192 GeV		196 GeV	
	Ndata	Nmc	Ndata	Nmc
window 1	1	.50±.13	2	1.23±.20
window 2	1	2.20±.29	11	5.30±.51
window 3	0	.15±.09	0	.07±.07

	200 GeV		202 GeV	
	Ndata	Nmc	Ndata	Nmc
window 1	4	1.57±.21	0	.74±.13
window 2	6	6.00±.44	4	2.70±.24
window 3	0	.12±.06	0	.08±.04



Exclusion : Assuming 100 % BR



Conclusion

- To try to have a look at lower gluino masses (no dE/dx tag)
- The Rhadron search will be done for the R^o case :
  - Problems due to the topology : 4 jets or 2 jets ?
  - Signal difficult to isolate from $q\bar{q}\gamma$ background
  - $\Longrightarrow$ Neural network method in progress
- At the end, the two analysis have to be combined to present results as a function of the probability P that the gluino fragments to charged Rhadrons.