

# Model Identification @1TeV

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## Status

The  $\cos\theta_{1,2}$  plots were compared with the templates of each models, then the chi2 was investigated.

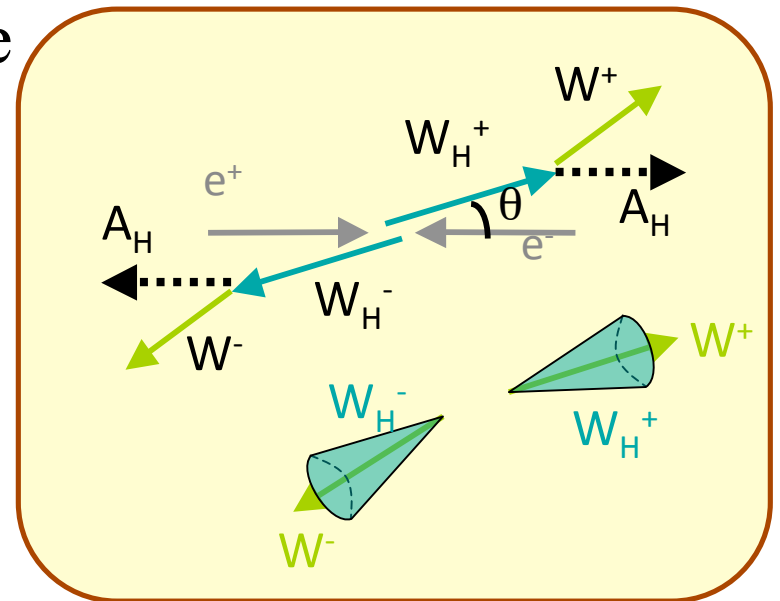
2009/12/9 Physics & Software meeting

# Production angle of charged particle

The charged particle candidates are reconstructed as **corn** around  $W$ .

If  $X^+$  and  $X^-$  are assumed as back-to-back, there are **2 solutions** for  $X$  candidates.

$\theta_1, \theta_2$



The 2-dimensional plots of  $\cos\theta_1$  and  $\cos\theta_2$  are compared about each models

$\Rightarrow$  The template is used

# Template

The templates were made by the following way

Production of signals and backgrounds in each model at  $5 \text{ ab}^{-1}$

Scaling the signals and backgrounds to  $500 \text{ fb}^{-1}$

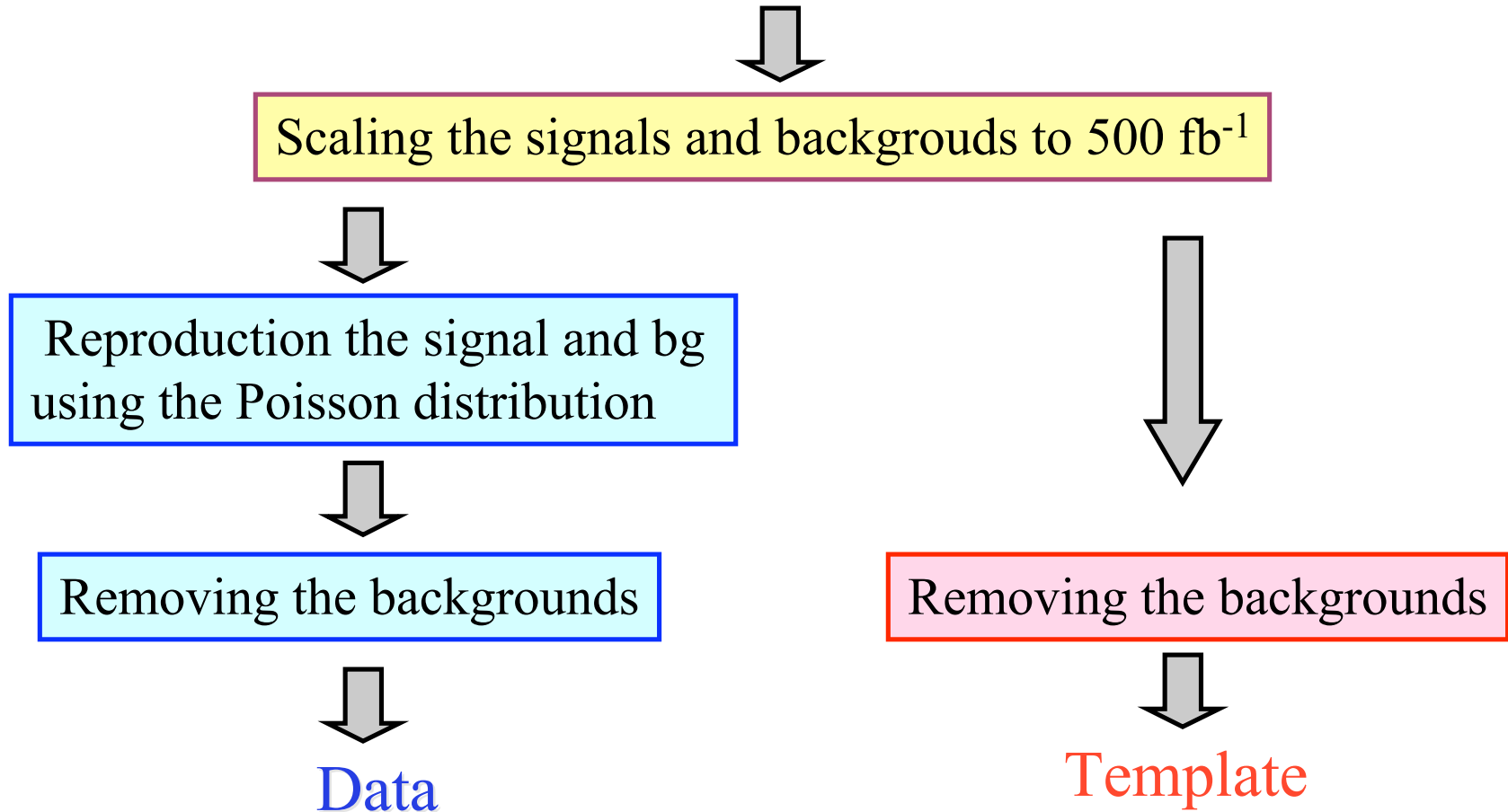
Reproduction the signal and bg using the Poisson distribution

Removing the backgrounds

Data

Removing the backgrounds

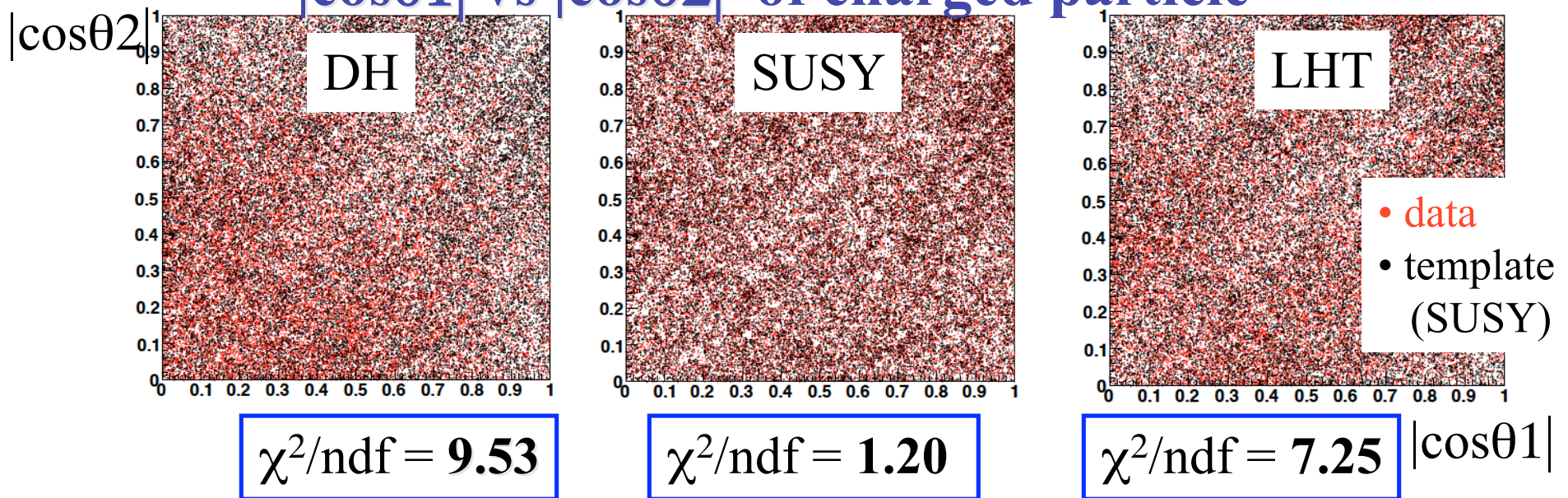
Template



# $|\cos\theta_1|$ vs $|\cos\theta_2|$ (template : SUSY)

The difference on the  $\cos\theta_1$  vs  $\cos\theta_2$  among each models are investigated by  $\chi^2$  at 100 fb. The template is SUSY.

## $|\cos\theta_1|$ vs $|\cos\theta_2|$ of charged particle



$$\chi^2 = \sum_{ij} \left( \frac{N_{ij}^{\text{data}} - N_{ij}^{\text{temp}}}{\sigma_{ij}} \right)^2$$

$$\sigma_{ij} = \sqrt{N_{ij}^{\text{data}}}$$

The values of  $\chi^2$ s are different at each models

# $\chi^2/\text{ndf}$

$\chi^2/\text{ndf}$  s are investigated about each models, changing the template.

Data	Template	chi2/ndf
<i>Dark Higgs</i>	Dark Higgs	1.16
	SUSY	9.53
	Little Higgs	7.56
<i>SUSY</i>	Dark Higgs	8.23
	SUSY	1.20
	Little Higgs	5.91
<i>Little Higgs</i>	Dark Higgs	7.53
	SUSY	7.25
	Little Higgs	1.30



There are the clear differences

It is possible to distinguish each models by the values of chi2

## Plan

- The threshold scan will be investigated by the fit