



No title

Vanya BELYAEV (Syracuse)



4 ways to make a physics analysis



- "native" DaVinci
 - *explicit* C++ , tools, explicit loops
- "DaVinci for busy people"
 - *.opts files
 - no C++
- LoKi
 - C++, which does not look like C++
 - Compact
- Bender
 - Python
 - Friendly
 - Perfect for prototyping

There is no

Take the best form all

- *Prototype* your algorithm with
 - **Bender/Python**
 - run with signal data and relatively small amount of background
 - Estimate for *acceptance, rec-efficiency, ...*
 - *Mass/Lifetime resolutions*
 - Few important *variables* for signal vs background discrimination
 - Prepare the *selection* algorithm
 - **DaVinci/opts** or **LoKi/C++**
 - Run the stripping/skimming over **LARGE** data, reduce
 - Code "analysis" algorithm
 - Large reduction: **Bender/Python**
 - Small reduction: **LoKi/C++**
 - Make "small" **N-tuple**, analyse with **ROOT/PAW**
- Iterate**



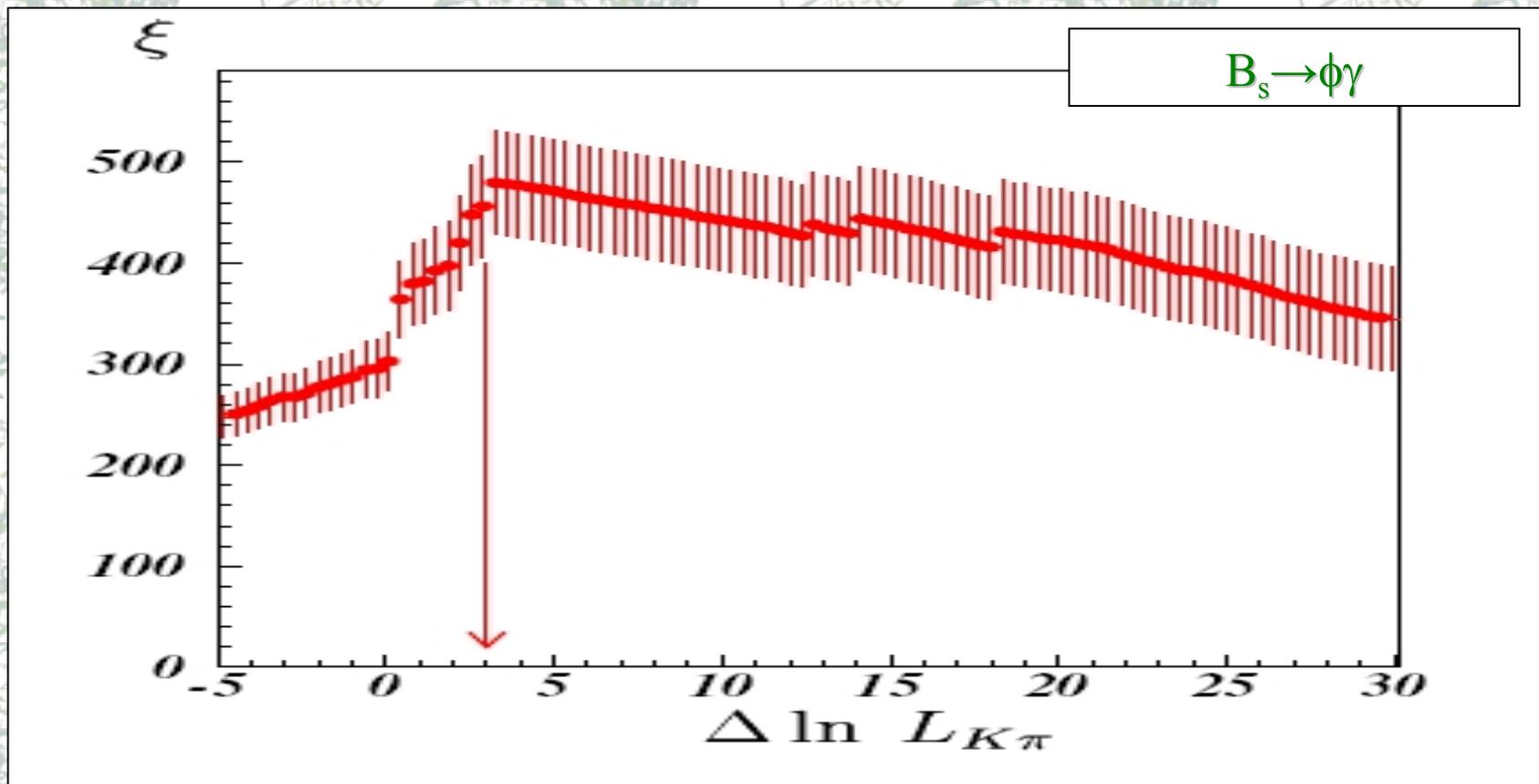


$$B_s \rightarrow \phi \gamma$$



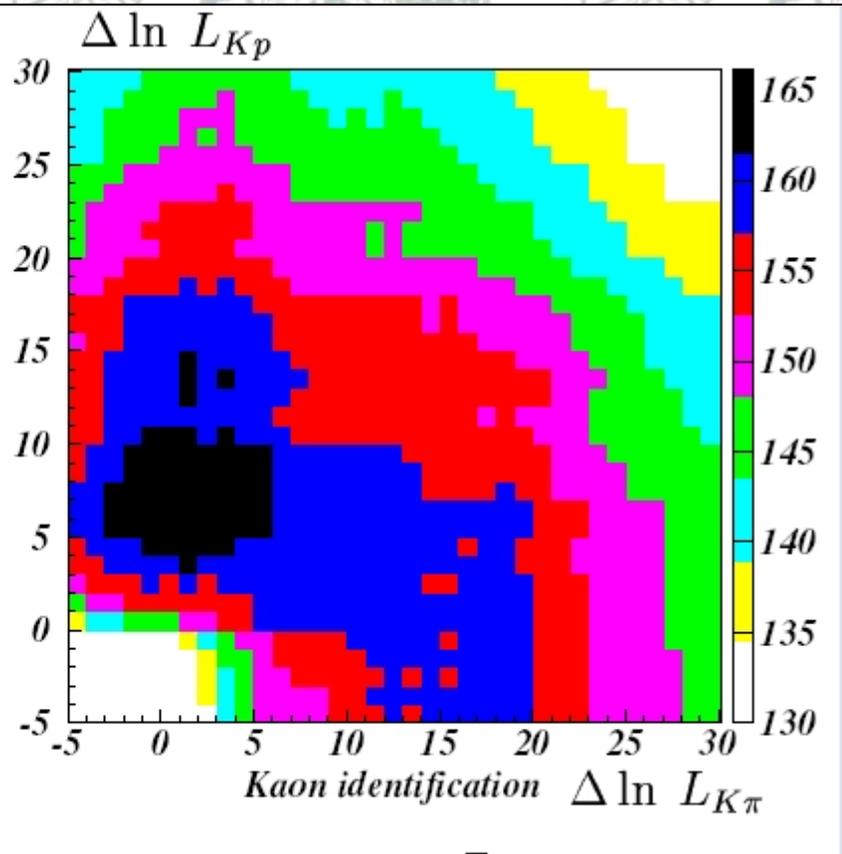
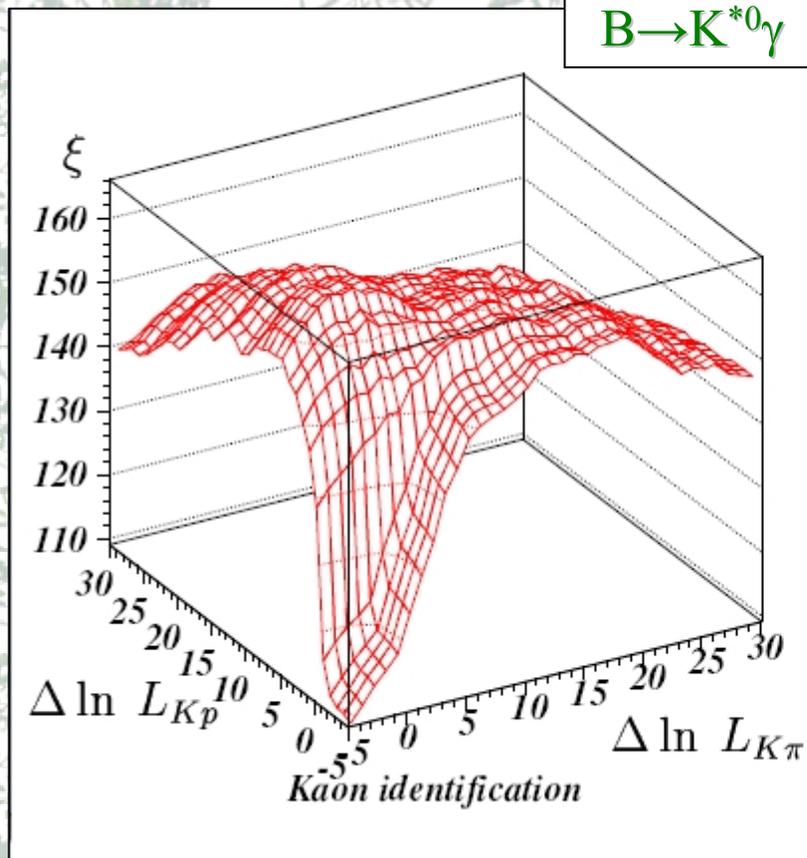
- Stripping/skimming (common with $B \rightarrow K^{*0} \gamma$, $\Lambda_b \rightarrow \Lambda \gamma$):
 - **LoKi/C++**
 - Very loose cuts, almost no PID, no tight cuts on PT, IP
 - Reduce $3 \cdot 10^7$ events to $\mathcal{O}(40000)$
 - 1 night or very long meeting, ...
- Final analysis step
 - **LoKi/C++**
- Final results
 - **OpenOffice**

$S/\sqrt{S+B}$

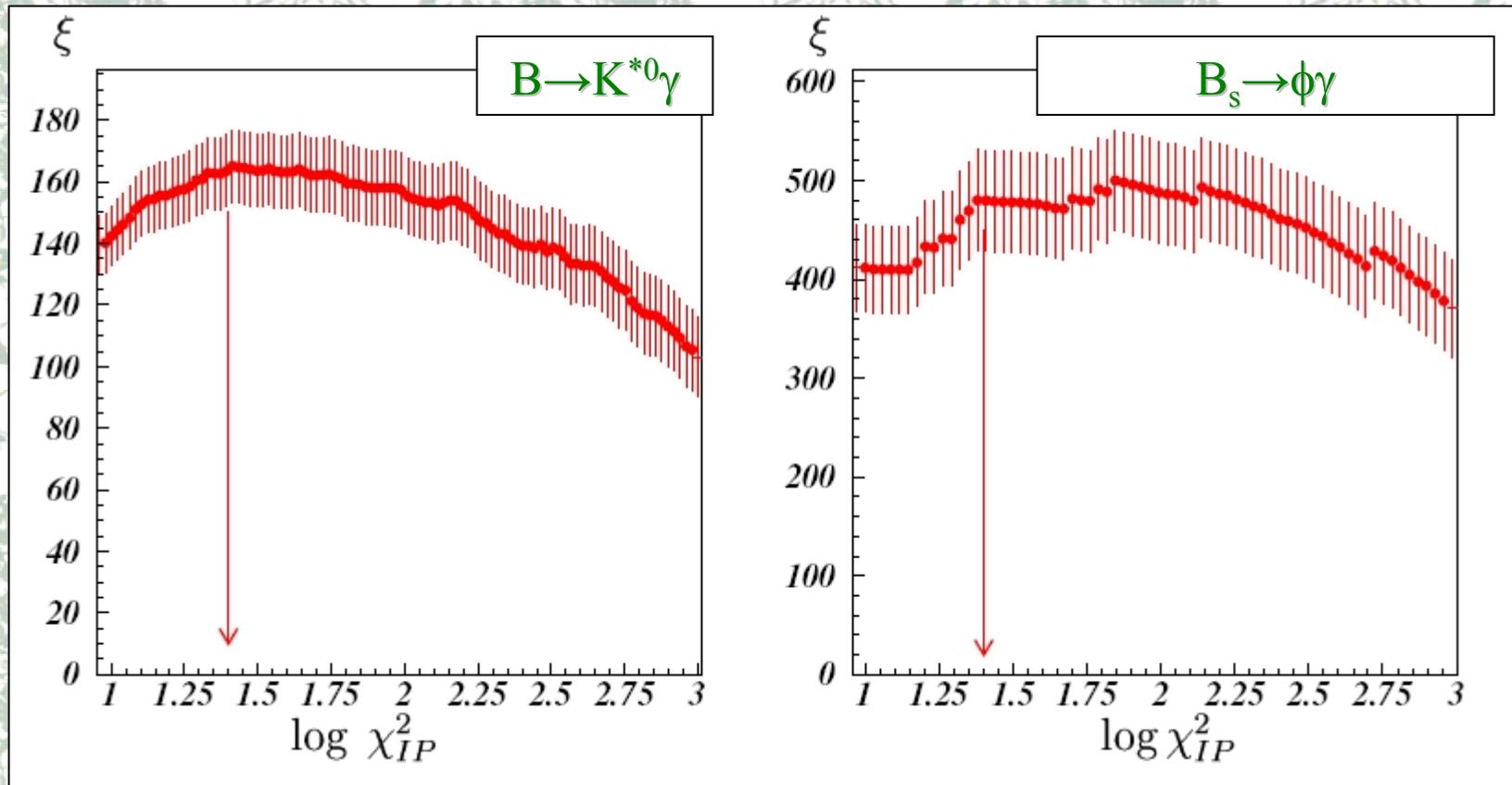


$S/\sqrt{S+B}$

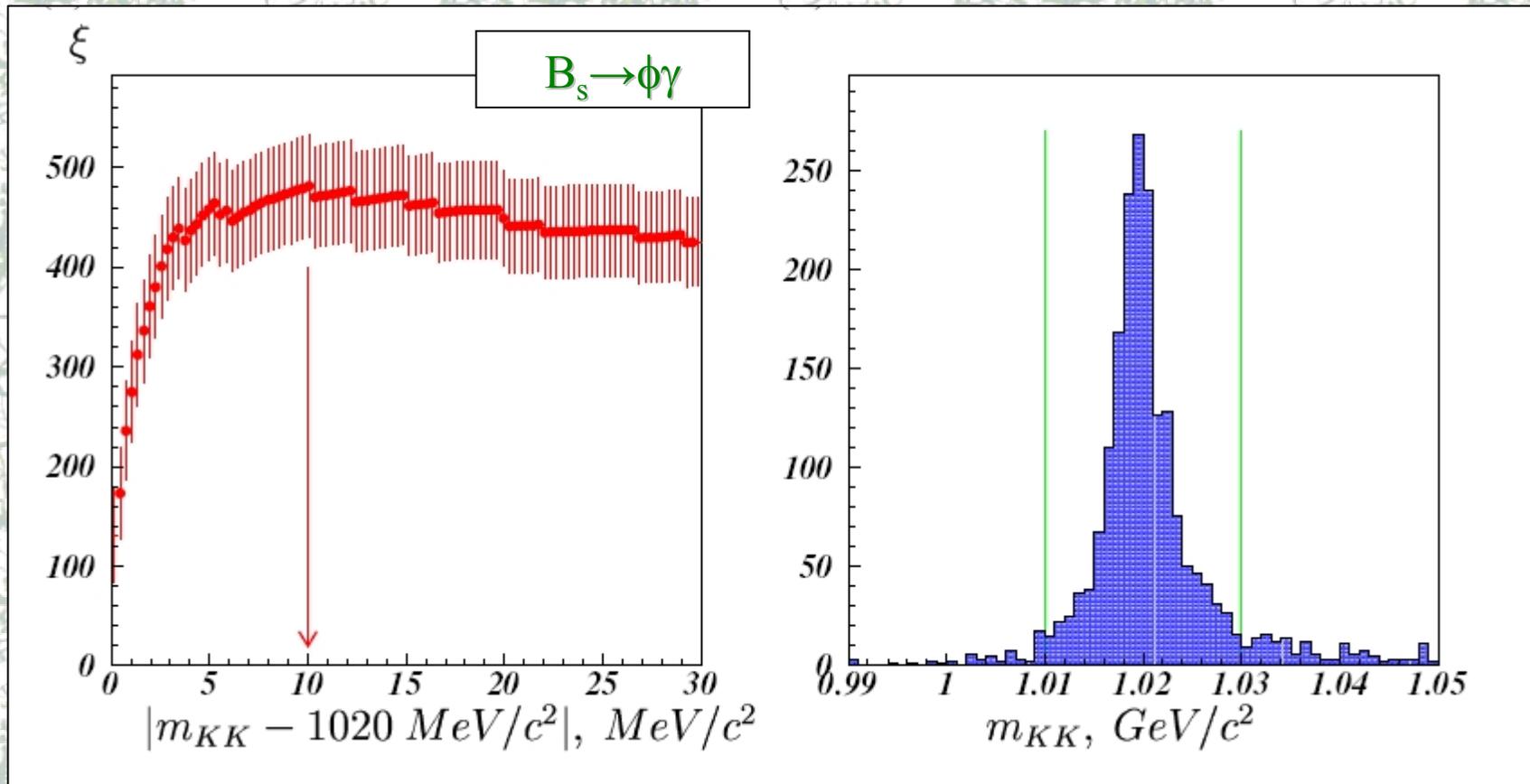
$B \rightarrow K^{*0} \gamma$



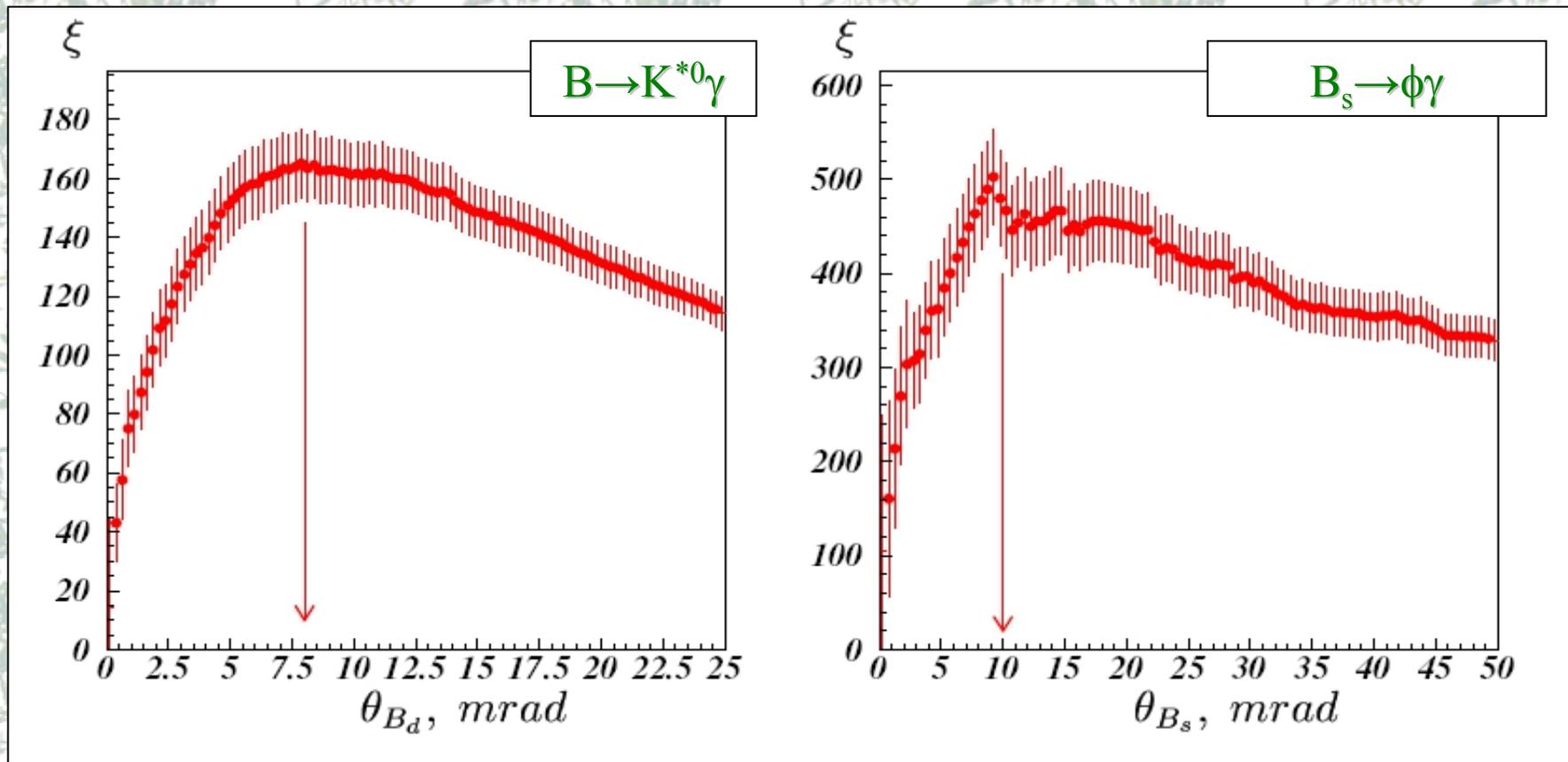
$S/\sqrt{S+B}$



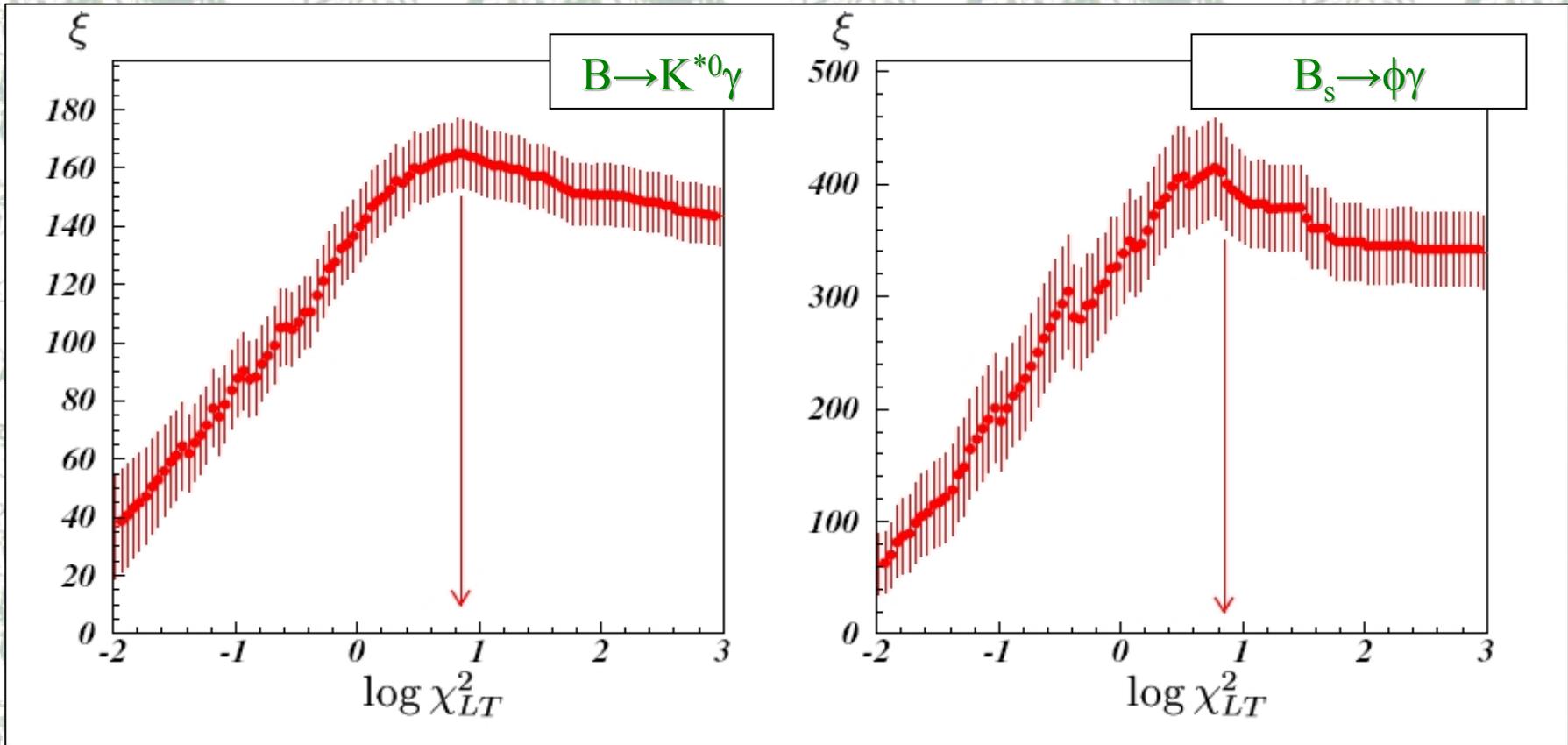
$S/\sqrt{S+B}$



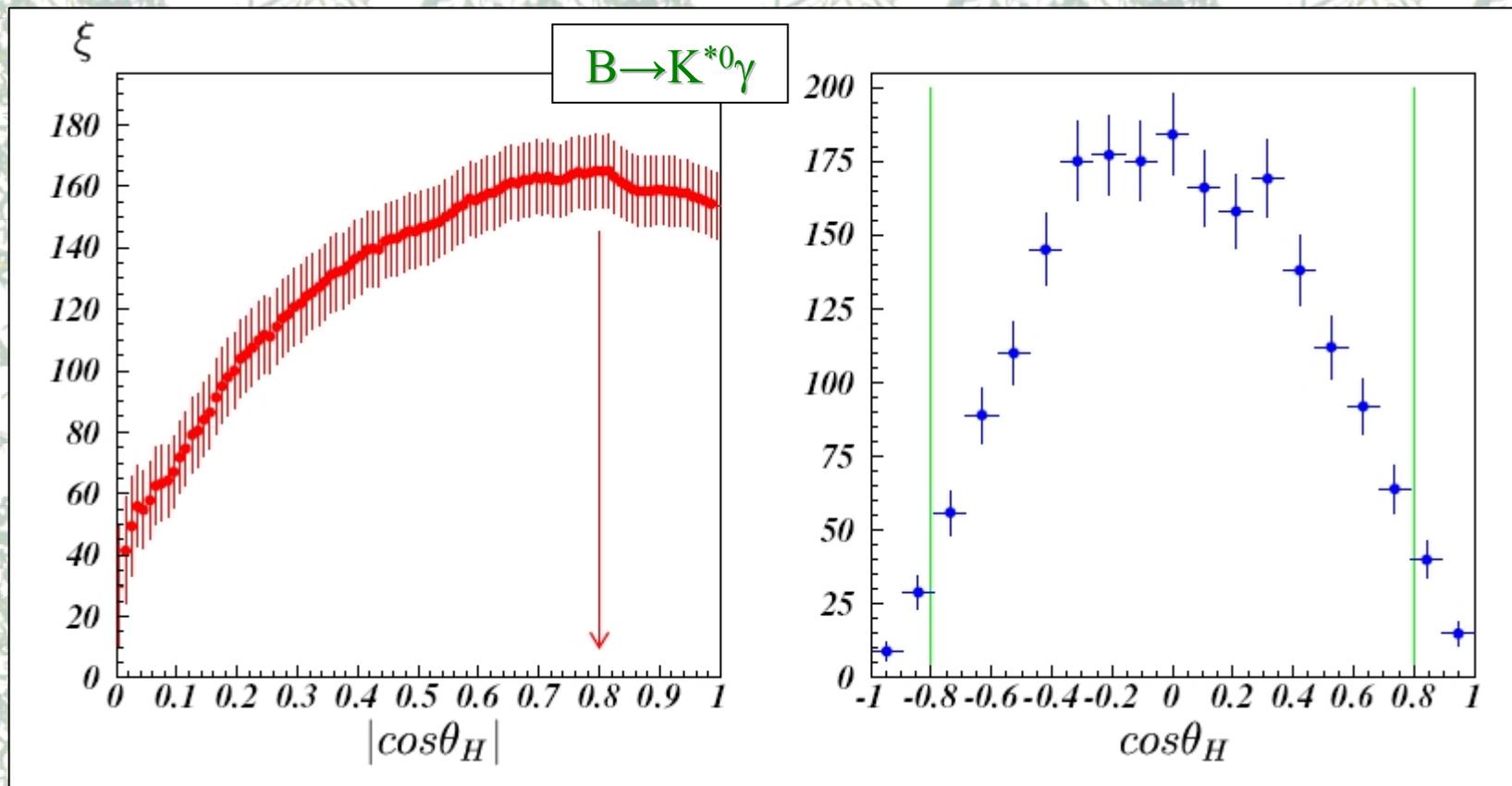
$S/\sqrt{S+B}$



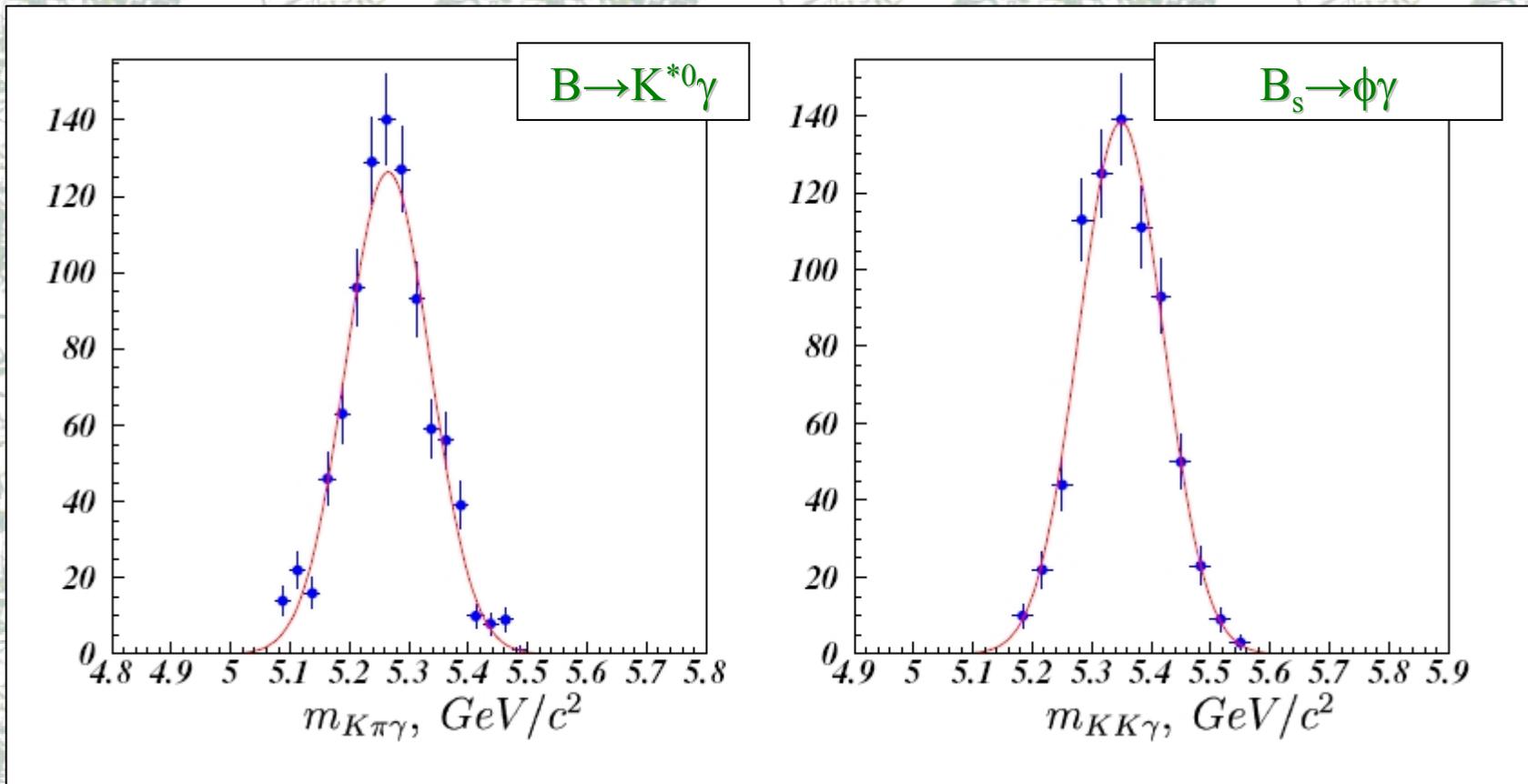
$S/\sqrt{S+B}$



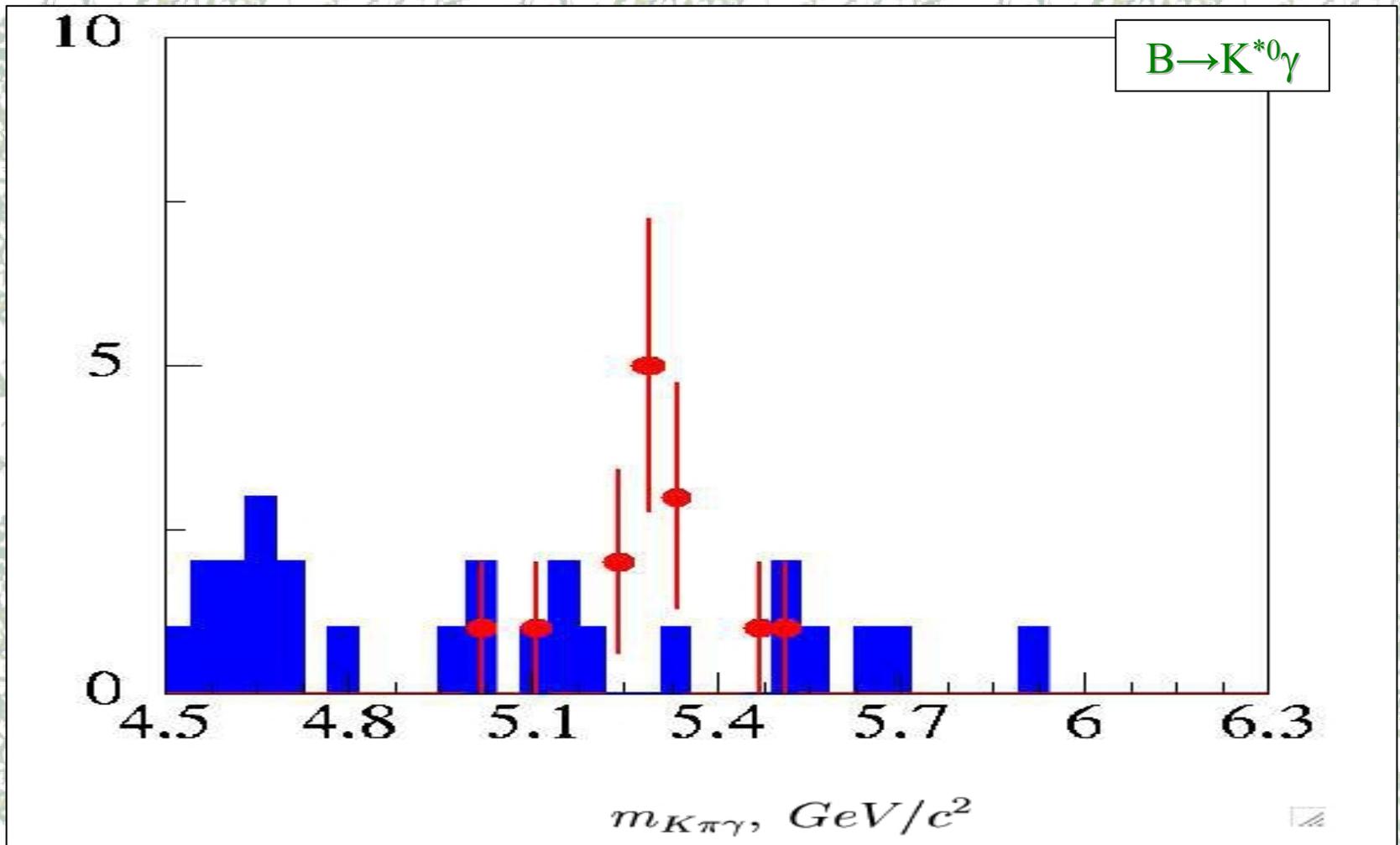
$S/\sqrt{S+B}$



Resolutions



13 minutes @ nominal conditions



$$B_s \rightarrow \mu\mu$$

- Stripping/skimming:
 - DaVinci/opts
 - Very loose cuts, almost no PID, no tight cuts on PT,IP
 - Reduce $3 \cdot 10^7$ events to $\mathcal{O}(20000)$
 - time to process 20k events $\mathcal{O}(1 \text{ hour})$: nice to run for the night or during lunch time, or meeting, ...
- Further (private) stripping:
 - LoKi/C++
 - A bit more tight cuts:
 - Reduce to $\mathcal{O}(2000)$
 - Time to process 2k events $\mathcal{O}(5')$ ~ 1 coffee cup or 1 phone call
- (Interactive) final analysis step
 - Bender/Python
- Final results
 - PowerPoint