

F-Praktikum

I.Vorbesprechung

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II. Vorbesprechung: 14:00 15/06/16, Bahrenfeld, Bld. 61

Why F-Praktikum?



- Scientific method
- Scientific publications
- Work independent



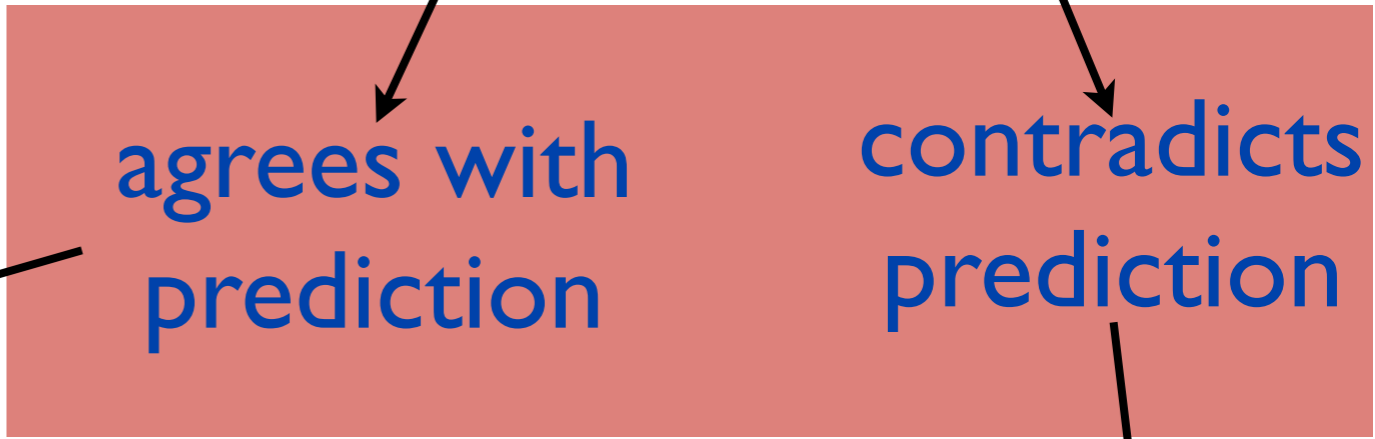
Physics

prediction (hypothesis)



theory:
mathematical model
of nature

experiment:
measurements of
observable quantities



open
questions?



Tools



- Theory → your responsibility (in principle not course dependent, but mind the preparation time !?)
- Statistics & error calculation → Statistic course 22-26/08
- Experimental skills → your responsibility
- Scientific writing

→ some suggestions at:

https://fpraktikum.physnet.uni-hamburg.de/info/hinweise_protokoll.html

better: get a good book ...

Struktur



- Das Praktikum wird in **Zweiergruppen** durchgeführt
- Die Dauer des F-Praktikums erstreckt sich über **zwei Semester**
- Für jeden Praktikumsversuch ist eine intensive Vorbereitung in Form eines Selbststudiums notwendig
- Es wird für jeden Versuch ein **Protokoll** angefertigt und zu einem der Versuche ein **Fachvortrag** ausgearbeitet und gehalten
 - Für einen der Versuche wird ein erweitertes Protokoll angefertigt (20-30 S.)
 - Für die anderen beiden Versuche wird ein verkürztes Analyse-Protokoll angefertigt (maximal 10 Seiten). Für einen dieser beiden Versuche wird zusätzlich ein Seminar-Vortrag gehalten
 - Die Zuordnung wird von uns getroffen und Ihnen rechtzeitig mitgeteilt

Struktur



- **22.-26.8.2016: Blockvorlesung** mit dem Titel 'Statistik und Datenanalyse in der Physik'. & **Computerübung** (-> Python & GNU Octave). Diese Veranstaltung ist für alle Teilnehmer verpflichtend.
- Im Anschluss: **Kurz-Versuch (KV)**, im Umfang reduziert, klarer Fokus auf ausgewählte Analyse-Methoden (z.B. Fitten, Statistik, Fourier)
- Darauf folgend werden **drei Versuche** durchgeführt, je einer aus den Themengebieten Festkörperphysik (P4), Kern- und Teilchenphysik (P5) und Atom-, Molekül- und Laserphysik (P6)

Ablauf



Option 1 (empfohlen):



Option 2 (möglich):



Option 3 (nicht empfohlen):



Registrierung



- Registrierung am Semesteranfang in STiNE
- Registrierung als Zweiergruppe auf einer Registrierungsseite (**ab 7. Juni 2016**) (siehe Link auf F-Praktikums-Seite ab 7. Juni)
- Verbindliche Wahl der **Versuche** (abhängig von gehörten Vorlesungen) und Wahl der **Zeitpunkte** der Durchführung. Dazu haben die Versuchsbetreuer im Vorfeld verfügbare Zeitfenster in einer Datenbank abgelegt.
- Registrierung nur für die Versuche für das aktuelle Semester möglich. Die Registrierung für die weiteren Versuche werden dann im darauffolgenden Semester vorgenommen.

Weitere Informationen



- Detaillierte Informationen und Hinweise unter <https://www.physnet.uni-hamburg.de/studium/studiengaenge/praktika/fortgeschrittenenpraktikum.htm>
- Fragen an fpraktikum@desy.de
- **2. Vorbesprechung:**
Mi. 15.06.2016, 14.00-17:00 Uhr
Hörsaal, Geb. 61, Campus Bahrenfeld

Evaluation



Each of the 4 experiment will be separately evaluated as follows:

Vorbesprechung

Durchführung

Ist Protokoll **

** maximum **2 weeks** time from experiment start to hand in the first version of the protocol.

Letzte Version ***

*** the last version of the protocol must be handed in **one week before the start of the next semester.**

- Each group presents the results of **one** experiment during the Friday seminars either in Jungiusstr. or in Bahrenfeld.
- The talk is evaluated
- The final note is the average of the evaluations of the four experiments and the seminar.

Presentations at the F-Praktikum seminar



Seminar dates:

- Each Friday during the F-Praktikum period (29.08.-16.09)

8:30-12:30 Jungiusstr, Horsaal 2

13:00-17:00 Bahrenfeld, building 61

- The list of talks will be provided in STINE + Praktikum web page

!!! YOU need to give us a valid email address if different from that on your STINE registration !!!

Presentations will be given in electronic form and must be **maximum 15 min.** long. + 15 min. discussion → ask questions !

Content of the seminar talk



Tips at: https://fpraktikum.physnet.uni-hamburg.de/info/hinweise_vortrag.html

The talk should follow the style of the protocol:

- title, authors, abstract
- introduction: physics subject, physics problem
- the set-up
- the measured data in suitable format (for graphics watch readability, labeling, e.g., not smaller than text size)
- evaluation and error calculation
- discussion of the results and summary,
- a reasonable list of references.

but ... **15 min max !!!**

make a choice:

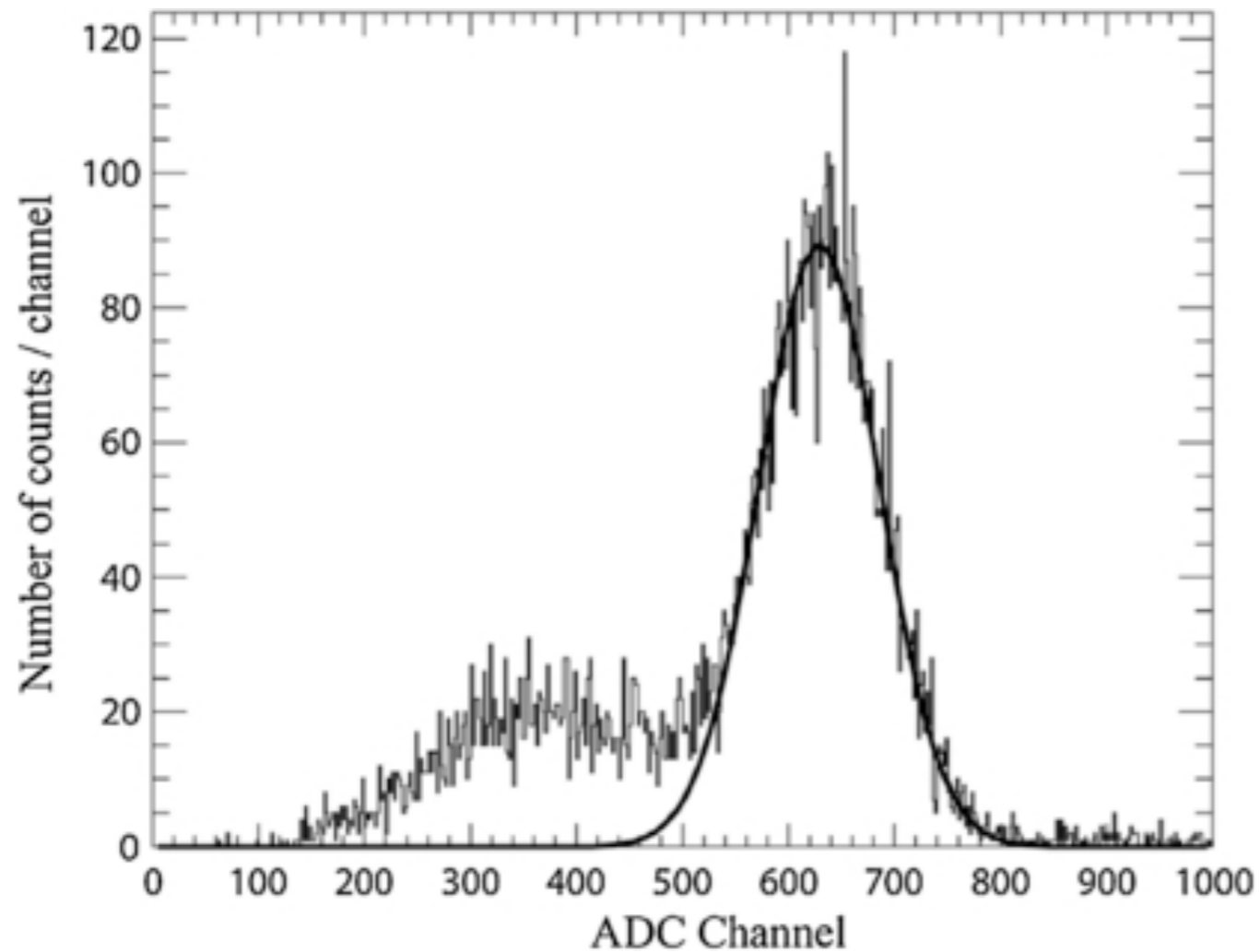
what was the most interesting / challenging / precise measurement?

focus on one/two topic(s) but discuss them well !

Spot the mistake?



my result



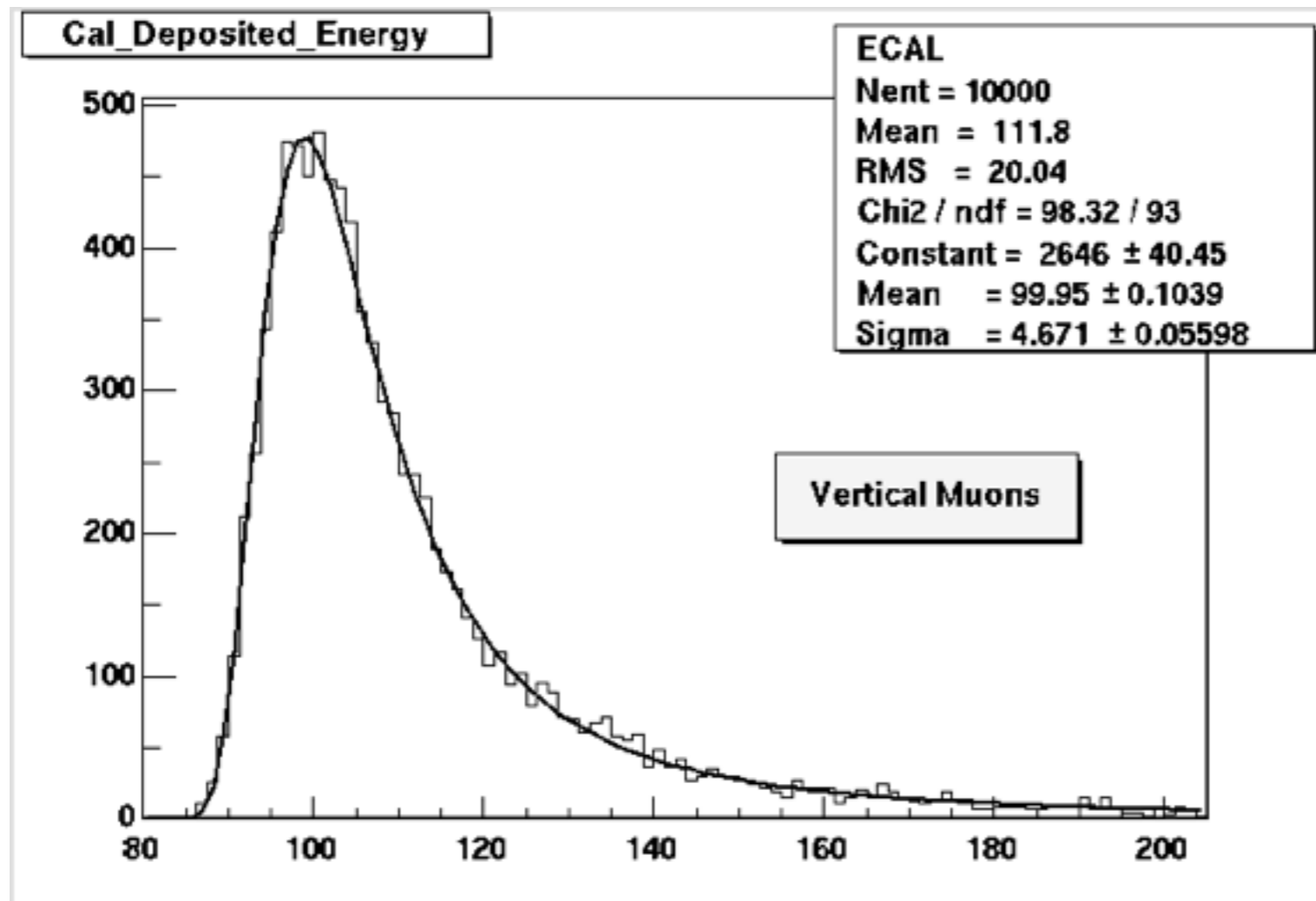
hot to extract physics from
a measurement?

what to fit?
how to fit?
error from fit?



Spot the mistake?

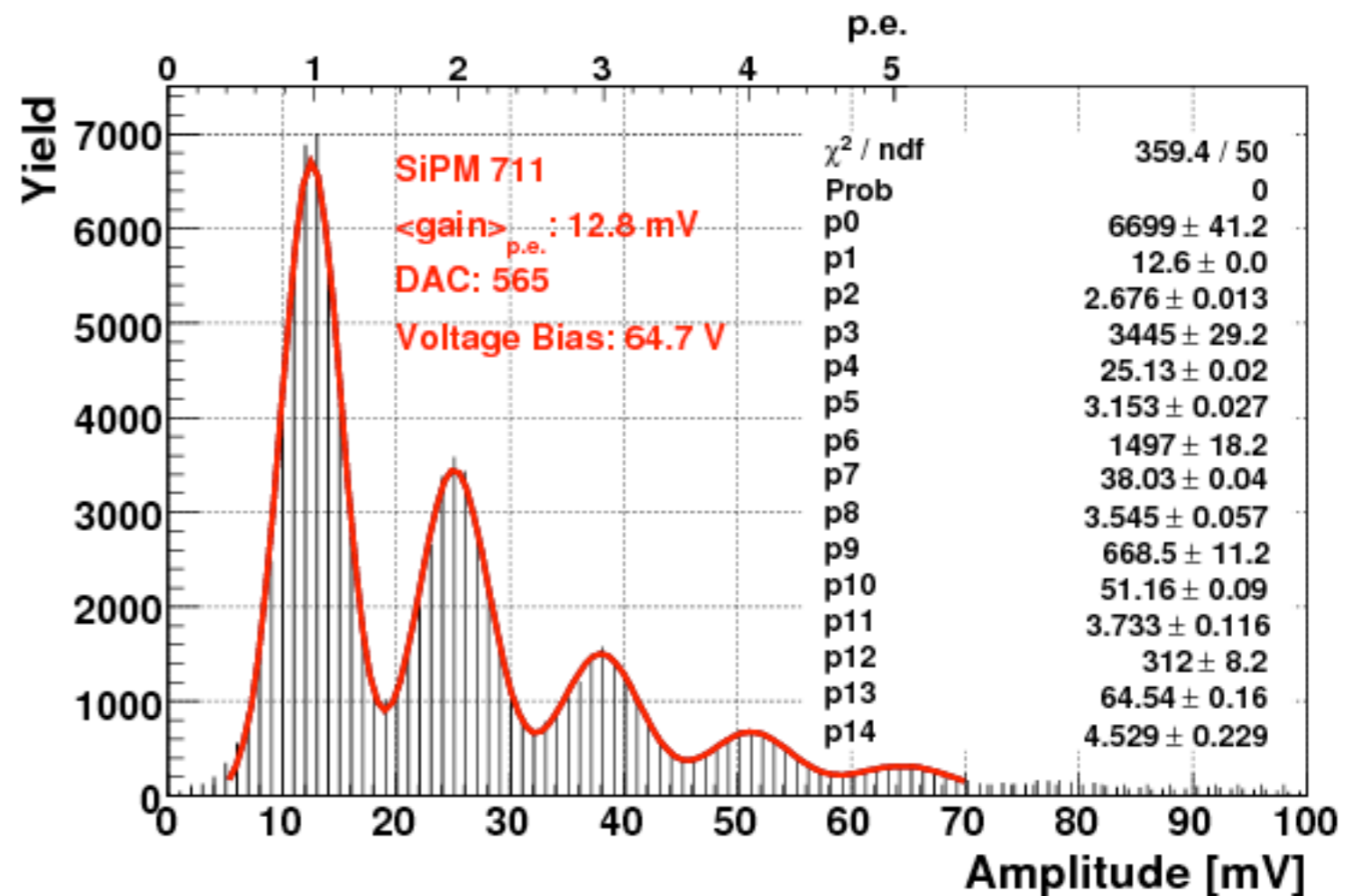
my result





Spot the mistake?

my result



Why do we need to learn statistics?

understand the underlying mechanism of a process allows to model it or simulate it

signal formation (stochastic, binomial, Poisson, ...)

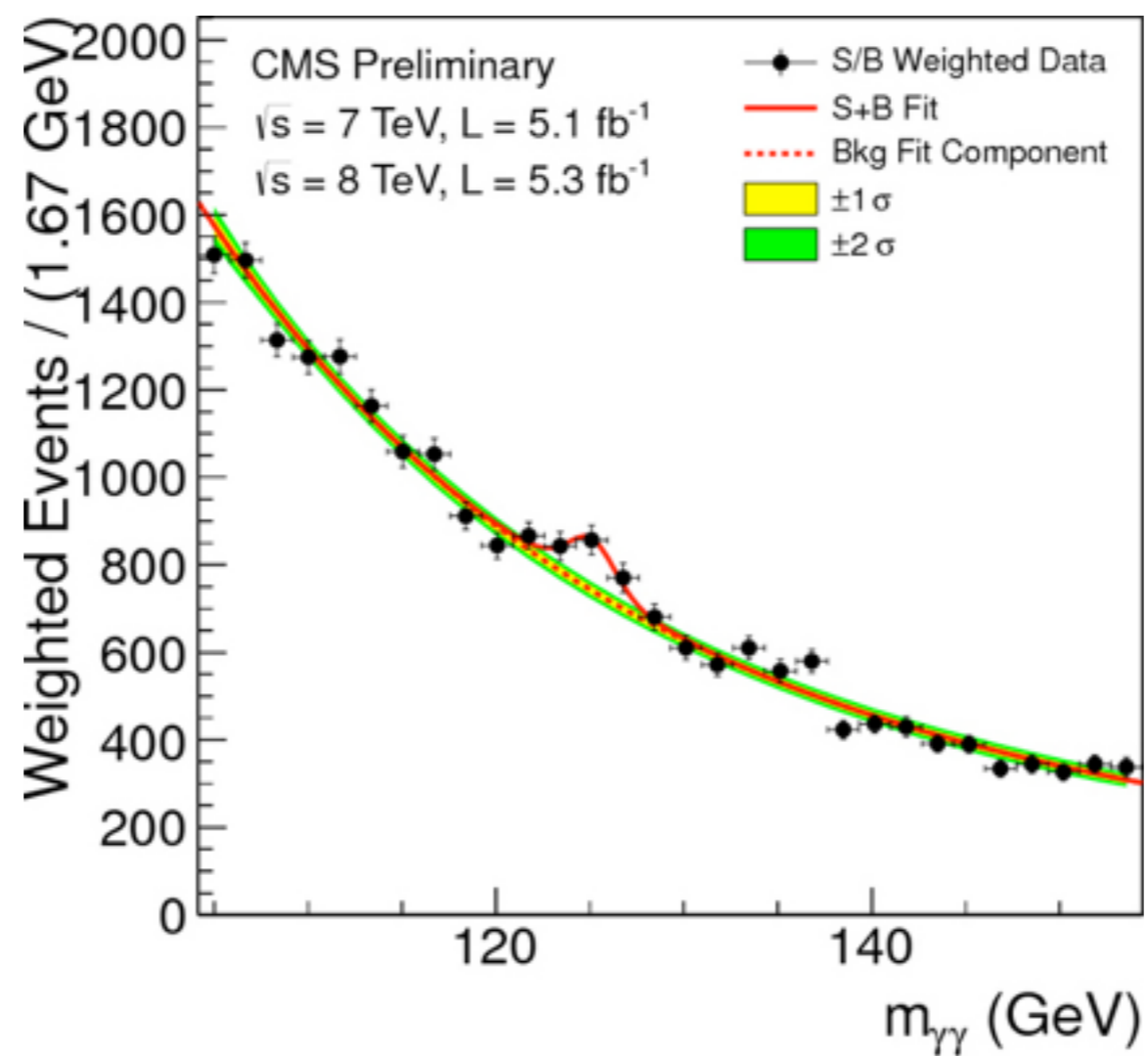
noise (uncorrelated, correlated, gaussian, non-gaussian)

... if you do not know better try to fit a pol50, it usually work ;-)



Spot the mistake?

my result



Research ethic



There are several reasons why it is important to adhere to ethical norms in research. First, norms **promote the aims of research**, such as knowledge, truth, and avoidance of error. For example, prohibitions against fabricating, falsifying, or misrepresenting research data promote the truth and avoid error. Second, since research often involves a great deal of cooperation and coordination among many different people in different disciplines and institutions, ethical standards promote the **values that are essential to collaborative work**, such as trust, accountability, mutual respect, and fairness. For example, many ethical norms in research, such as guidelines for authorship, copyright and patenting policies, data sharing policies, and confidentiality rules in peer review, are designed to protect intellectual property interests while encouraging collaboration. Most researchers want to receive credit for their contributions and do not want to have their ideas stolen or disclosed prematurely. Third, many of the ethical norms help to ensure that researchers can be held **accountable to the public**. For instance, federal policies on research misconduct, conflicts of interest, the human subjects protections, and animal care and use are necessary in order to make sure that researchers who are funded by public money can be held accountable to the public. Fourth, ethical norms in research also help to build **public support** for research. People more likely to fund research project if they can trust the quality and integrity of research. Finally, many of the norms of research promote a variety of other important **moral and social values**, such as social responsibility, human rights, animal welfare, compliance with the law, and health and safety. Ethical lapses in research can significantly harm human and animal subjects, students, and the public. For example, a researcher who fabricates data in a clinical trial may harm or even kill patients, and a researcher who fails to abide by regulations and guidelines relating to radiation or biological safety may jeopardize his health and safety or the health and safety of staff and students.

Werbung

