



# CP Studies and Non-Standard Higgs Physics


Sabine Kraml

Welcome and charge to the meeting

14-16 Dec 2005, CERN

# History of meetings

- 14-15 May 2004 at CERN
- 02-03 Dec 2004 at CERN
- 24-25 Mar 2005 at SLAC
- 14-16 Dec 2005 at CERN



**CPNSH**  
CP Studies and Non-Standard Higgs Physics

**4th workshop**  
**Dec 14-16, 2005**  
**CERN**

Organizing Committee:  
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Seong Youl Choi  
John Conway  
John Ellis  
Rohini Godbole  
Jack Gunion  
JoAnne Hewett  
Sabine Kraml  
Maria Krawczyk  
Michelangelo Mangano  
David Miller  
Yasuhiro Okada  
Mark Oreglia

Topics:  
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CPV in 2HDM  
MSSM with CPV  
MSSM with RPV  
Extra singlets  
Extra gauge groups  
Little Higgs  
Extra dimensions  
Higgsless models  
Strong EWSB  
etc.

<http://cern.ch/kraml/cpnsh>

Main purpose of this meeting  
is to prepare the report!

The Hitchhikers guide  
to non-standard Higgs physics  
(to be published as a Yellow Book)

Topics:

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CPV in 2HDM

MSSM with CPV

MSSM with RPV

Extra singlets

Extra gauge groups

Little Higgs

Extra dimensions

Higgsless models

Strong EWSB

etc.

# Structure of the report

Each topic/section consists of

1. **A paedagogical introduction** to the subject, roughly of the order of 10 pages (review of the topic for non-experts, main ideas, main features, key parameters, signatures, model variants, etc.)
2. **Individual contributions** of the order of 5 pages, discussing further ideas, more technical details, collider-specific issues, simulations, tools, etc. etc.

# Today

- **The CP violating two Higgs doublet model**
  - Thorough theory introduction (12p., H. Haber and M. Krawczyk)
  - Overview of phenomenology (4p., G. Grenier, H.H and M.K.)
  - ca. 10 individual contributions
- **The MSSM with CP phases**
  - Introduction by M.Boonekamp, M.Carena, S.Y.Choi, J.S. Lee and M.Schumacher: theory + phenomenology @ colliders
  - ca. 12 individual contributions, several talks at this meeting

**Both sections in a very good state.**

Drafts available here and on the web; please discuss and comment.

# Tomorrow morning

- **SUSY models with an extra singlet**
  - Introduction by J. Gunion, D. Miller and A. Pilaftsis almost final
  - They are all here: good opportunity to discuss !
  - 5 individual contributions: field theoretic, phenomenological and cosmological aspects 😊 but no experimental analyses 😞
- **SUSY with R-parity violation**
  - Introduction by M. Besancon and W. Porod in progress
  - 2 individual contributions = talks at this meeting

Copies of introductions will be made available during the meeting.

# Tomorrow afternoon

- **Extra gauge groups**
  - Introduction by P. Langacker, A. Raspereza and S. Riemann, very good example of theory+experiment cooperation
  - Talk by R. Nevzorov on ESSM
- **Little Higgs models**
  - Introduction by T. Gregoire, B. McElrath and H. Logan in progress
  - Overview talk by A. Deandrea
- **Extra dimensions: ADD and RS**
  - ADD introduction ready, D. Dominici is here
  - RS: intro in progress (J. Hewett, T. Rizzo, S. Ferrag)
  - Talk on graviton search in CMS by V. Litvin

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# Friday morning

- **Higgsless models**
  - Intro by B. Lillie and J. Terning in progress
  - Talk by D. Dominici at this meeting
- **Strong electroweak symmetry breaking**
  - Chiral EWSB: W. Kilian, T. Han, in progress
  - Dynamical EWSB: G. Azuelos and F. Sannino  
(intro is ready, review talk by F.Sannino)
- **Nonstandard Higgs and EW baryogenesis**
  - Review talk by S. Huber

Copies of introductions will be made available during the meeting.

# General comments

- Higgs-sector CPV: very active, good progress
- Other models: good progress for introductions but lack of individual (th+exp) contributions
- We have foreseen plenty of time for discussions
- Have a look at the available material (on the webpage, handouts) and give us your feedback
- Organisers and conveners meeting Thu 16:10
- Final discussion (all) on Friday 13:30

# Talks

- Scheduled times are 20min or 30min plus 10min of discussion