



Contribution ID: 43

Type: Oral Presentation

## Probing new physics in the Higgs sector with effective field theories at the Large Hadron Collider

*Tuesday, 30 June 2015 15:00 (20 minutes)*

**Abstract content**   
 (Max 300 words)   
 [http://events.saip.org.za/getFile.py/a?target=\\_blank](http://events.saip.org.za/getFile.py/a?target=_blank)   
 **Formatting & Special chars**

With the discovery of a particle consistent with a Higgs boson a new window of opportunity for searches for new physics opens up. These can be performed via precision physics or direct searches. The ATLAS and CMS experiments study the Higgs boson couplings to other particles assuming that their structure is the same as that predicted in the Standard Model. With the addition of new physics via higher dimensional operators, in the framework of an effective field theory, the structure of these couplings changes. The implications on the Higgs boson production rates and the differential cross-sections are discussed. Prospects for the sensitivity of the ATLAS and CMS experiments to these higher dimensional operators are also discussed. This includes measurements both at the level of decay and production. Direct searches for new physics in the Higgs sector includes searches for new bosons and signatures in association with the newly discovered boson. The search for the Higgs boson decaying into or produced in association with Dark Matter is particularly relevant. The significance of Run I results and prospects for Run II with regards to direct searches are also discussed.

**Apply to be considered for a student award (Yes / No)?**

No

**Level for award (Hons, MSc, PhD, N/A)?**

N/A

**Main supervisor (name and email) and his / her institution**

N/A

**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

Yes

**Please indicate whether this abstract may be published online (Yes / No)**

Yes

**Primary author:** Prof. MELLADO, Bruce (University of Wisconsin - Madison)

**Co-authors:** Dr MARCH, Luis (University of the Witwatersrand); Dr RUAN, XIFENG (WITS)

**Presenter:** Prof. MELLADO, Bruce (University of Wisconsin - Madison)

**Session Classification:** NPRP

**Track Classification:** Track B - Nuclear, Particle and Radiation Physics