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Searching for 'Bumps' in the Dilepton Invariant Mass Spectrum using BumpHunter in pp collision at $\sqrt{s} = 13$ TeV with the ATLAS Detector ELHAM E KHODA, Univ British Columbia, ATLAS COLLABORATION — Additional massive Z' gauge bosons occur frequently in the extension of the Standard Model or its minimal supersymmetric extension. The discovery potential of this hypothetical spin-1 gauge boson is very high in the run-II of LHC and there is a high possibility of observing dilepton resonance in 2016 data. The ATLAS experiment searches for proton-proton collisions where two high energy, same-flavour leptons are produced and analyses their invariant mass spectrum. The search incorporates several sophisticated tests to determine the significance of an observed excess.

BumpHunter is a model independent statistical test which searches for deviations in the data from the expected background. We study the sensitivity of BumpHunter for discovery in the 2016 data set. In addition we study several methods, within the BumpHunter framework, for combining data from two channels ($ee, \mu\mu$) of different resolutions.

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