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## Non-Gaussian elliptic flow fluctuations

*Thursday, 30 June 2016 12:00 (20 minutes)*

The ATLAS collaboration has accurately measured elliptic flow,  $v_2$ , using multi-particle cumulants [arxiv:1408.4342], and observed for the first time a slight difference between  $v_2\{4\}$  and  $v_2\{6\}$ . If the fluctuations of  $v_2$  were Gaussian, all cumulants would coincide beyond order 4 [arXiv:0708.0800] therefore this measurement shows that  $v_2$  fluctuations are slightly non-Gaussian. Elliptic flow is understood as a consequence as the hydrodynamic response to the initial eccentricity  $\varepsilon_2$ . Non-Gaussian  $v_2$  fluctuations can be generated by non-Gaussian  $\varepsilon_2$  fluctuations or by nonlinearities in the hydrodynamic response. We show that both mechanisms are likely to be important. We carry out event-by-event viscous hydrodynamic simulations and compare our results with ATLAS data.

### **On behalf of collaboration:**

None

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