

Bell's instability: from astrophysics to laboratory experiment

Chun-Sung Jao¹, Ye Chen¹, Matthias Gross¹, Mikhail Krasilnikov¹, Gregor Loisch¹,
Timon Mehrling², Jacek Niemiec³, Anne Oppelt¹, Alberto Martinez de la Ossa⁴,
Jens Osterhoff², Martin Pohl^{1,5}, Frank Stephan¹, Sergei Vafin^{1,5}

ARD-ST3 Annual Workshop

20.07.2017

¹DESY, Zeuthen, Germany

²DESY, Hamburg, Germany

³Institute of Nuclear Physics PAN, Krakow, Poland

⁴Institute of Experimental Physics, University Hamburg, Germany

⁵Institute of Physics and Astronomy, University of Potsdam, Potsdam-Golm, Germany



Bell's instability: from astrophysics to laboratory experiment

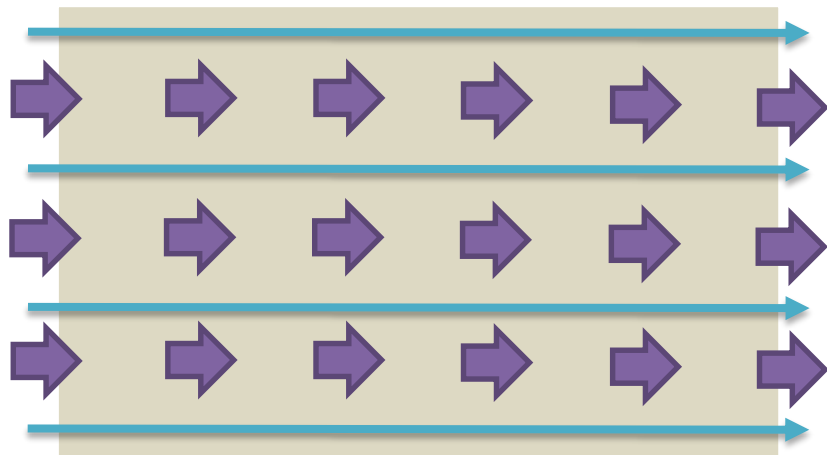
- Bell's instability in astrophysics

- drifting cosmic ray along a background magnetic field into upstream plasma

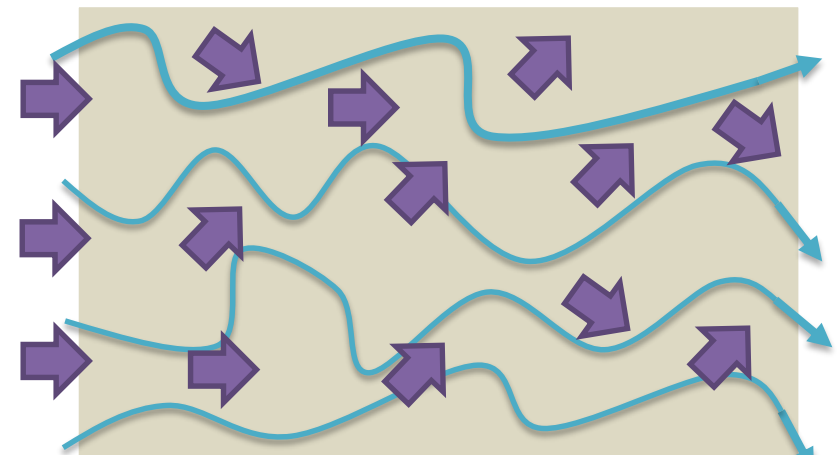
- magnetic turbulence in the upstream region

- Efficient particle acceleration at shocks

Upstream plasma region of shock



Upstream plasma region of shock



Drifting cosmic ray

Background magnetic field

Drifting cosmic ray

Background magnetic field

Bell's instability: from astrophysics to laboratory experiment

- Bell's instability in laboratory astrophysics
 - To present Bell's instability in the laboratory by using the electron beam accelerator and plasma chamber in PITZ, DESY, Zeuthen
 - To test the saturation level and mechanism in the laboratory

