Big Picture: ML for Jet Physics & Fast Simulation

- **Very Active Area**
  - Boosted jet tagging, q/g discrimination, flavor tagging, etc.
  - Jets are complicated objects, ML techniques are doing very well
 - GEANT, ATLAS, CMS have fast-sim efforts
- **Physics challenges promote R&D efforts**
  - adversarial training to reduce systematics
  - weakly-supervised training with real data
  - Jet grooming & Pileup mitigation with ML
  - Simultaneously train fast sim & taggers
- **Support "Challenges", RAMPs, etc.**
  - Needs effort to document, curate, etc.
  - Makes it easier to track progress and compare methods: eg. **good for metrics**

- Use complete **standard CSV b-tag "Tag info"** (from ~30→60)
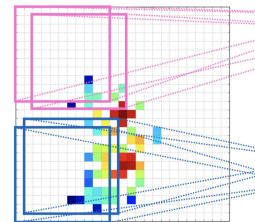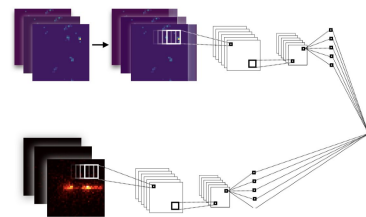- Dense Deep Neural Network (Dense)
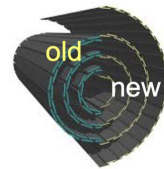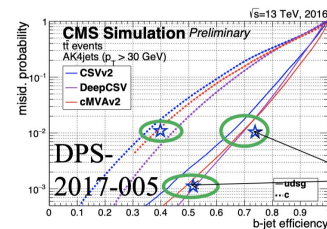
☆Old tagger with new pixel detector in simulation

Similar impact as the new inner pixel!

Machine Learning for Jet Physics 2018

indico.cern.ch/event/ml4jets2018

Images: J. Lin, B. Nachman, L. de Oliveira

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