Associated production of quarkonium with jets with QCD corrections: towards an interface to general-purpose Monte-Carlo codes

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supervisor: Dr. Jean-Philippe Lansberg, IJCLab
Prof. Ronan McNulty, University College Dublin

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New Entrants Day of the Theory Pole
1 December 2021, IJCLab, Paris-Saclay University

about me...

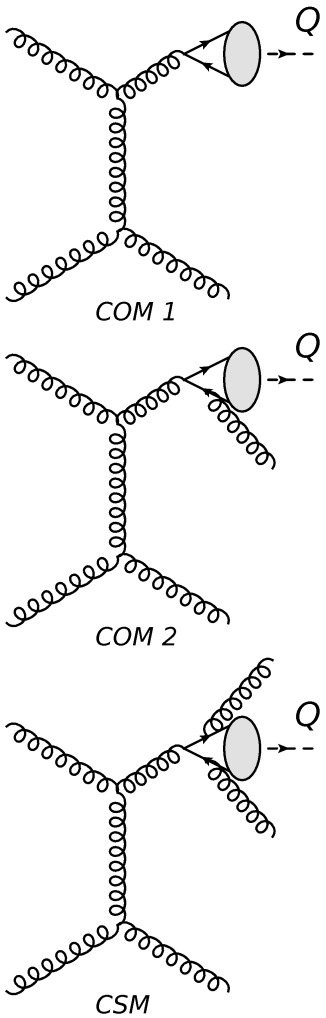
Education

- Now: PhD with support of ADI 2021 grant, University Paris-Saclay, PHENIICS doctoral school
- NPAC (Nuclei Particles Astroparticles Cosmology) Master 2 (IDEX Scholarship), Paris-Saclay University, France, (2020-2021)
- Master in Physics at Research institute the School of Physics and Technology, V. N. Karazin Kharkiv National University, Ukraine (2019-2021)

Internships in IJCLab and IPN Orsay (Supervisor: Dr. Lansberg):

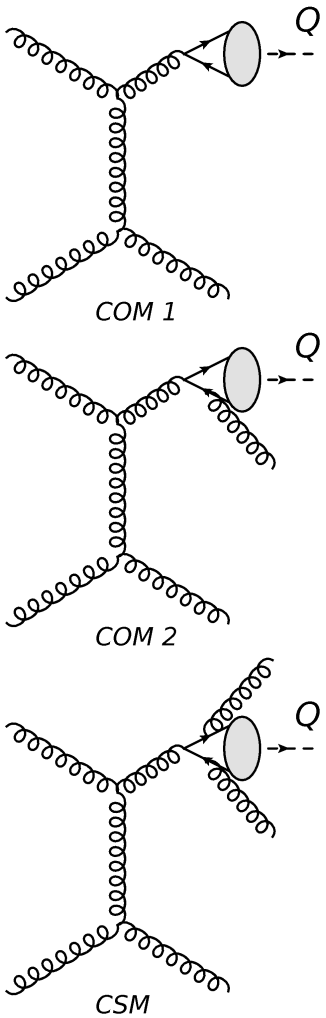
- Inclusive J/ψ photo-production up to next-to-leading order in α_S for the Electron Ion Collider predictions (21 March 2021 - 25 June 2021)
- The inclusive quarkonium production at HERA and EIC at high transverse momenta (1 February 2020 - 31 March 2020, 1 September 2019 - 31 October 2019, 2 Erasmus+ grants)

Quarkonium and jets



- The objective of this PhD project is to study assosiated production of quarkonium and jets.
- A jet is a narrow cone of hadrons and other particles, which travel in the same direction and are produced by the hadronization of a quark or gluon.
- Quarkonium is a flavorless meson, which consists of a heavy quark and its antiquark.

Quarkonium and jets



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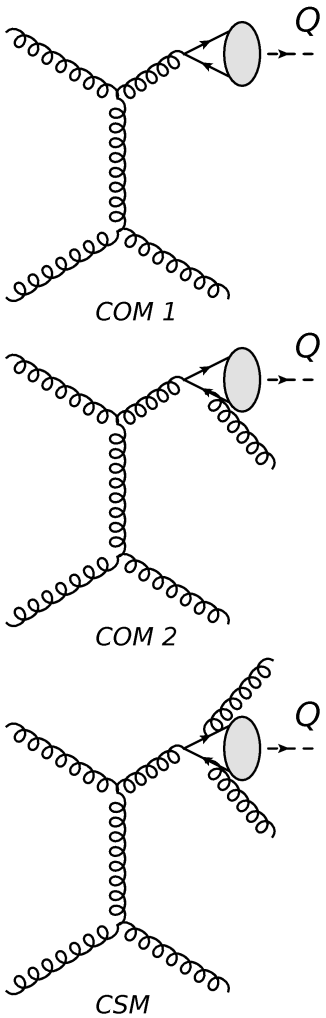
- Light quarks and gluons are confined, so we are studying them via jets.

Quarkonium and jets



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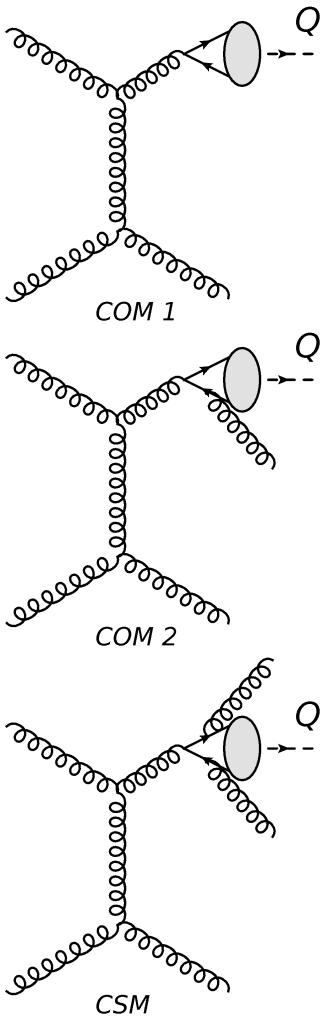
  - Colour Singlet Model;
  - NRQCD and Colour Octet Mechanism;
  - Colour Evaporation Model;

Quarkonium and jets



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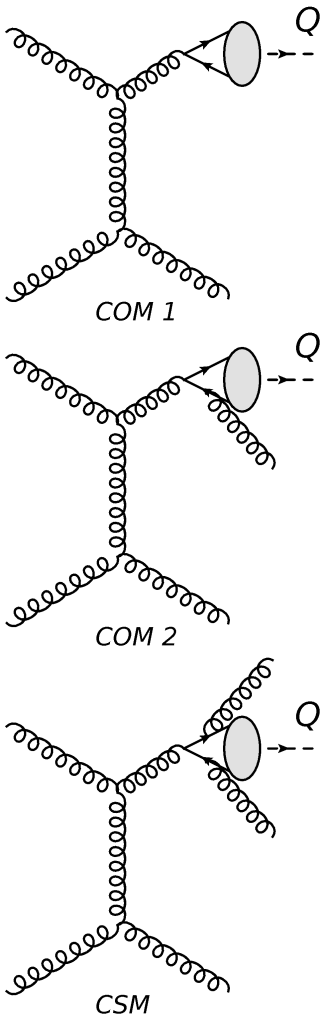
Quarkonium and jets



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- Quarkonium can be also used as a hard probe of QGP and we can study how jets interact with the colour medium