**Title: Search of saturation physics at a future Electron-Ion Collider (EIC) with dihadron correlation measurements**

## Chpt 1. QCD and Deep inelastic scattering (DIS)

* 1. Basics of QCD theory
  2. Introduction to DIS
  3. Factorization theorem and Parton distribution function (PDF)
  4. PDF evolution

## Chpt 2. Saturation physics

* 1. Collective dynamics of gluons at small x
  2. Color glass condensate

## Chpt 3. Search of saturation signature in current experiments

* 1. DIS studies at Hera: geometric scaling, diffractive scattering
  2. pA/dAu at RHIC/LHC: dihadron correlation, RpA at forward rapidity
  3. Connections to AA collisions: initial state and cold nuclear medium effect

## Chp 4. Saturation studies to be performed at EIC

1. EIC detector: model detector, eSTAR/ePHENIX
2. eA physics program at EIC:
   1. nuclear imaging
   2. in medium parton hadronization
   3. gluon saturation
3. Measurements to study saturation at EIC:
   1. nuclear PDF, F2, FL
   2. Diffractive events
   3. dihadron correlations

## Chpt 5. Monte Carlo generator development

* 1. Available MC generators to simulate DIS events on the Market
  2. A hybrid eA MC generator design

## Chpt 6. Dihadron correlation measurements as a method to study saturation

* 1. Dihadron correlation in saturation formalism
  2. Simulations of dihadron correlation
  3. Detector effect estimation

## Chpt 7. Determination of collision geometry in eA

1. Collision geometry and saturation
2. Quantities to describe collision geometry
3. Forward neutron number as a geometry tagger

## Chpt 8. Summary