Jet evolution
in a dense
QCD medium

Linnéa Gräns
Samuelsson

Intro

Theoretical
background

Simulation

Outro

Jet evolution in a dense QCD medium

Linnéa Gräns Samuelsson

Internship at CEA Saclay
Supervisors: Edmond Iancu and Gregory Soyez

June 27, 2017

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Structure of the report:
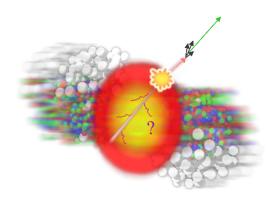
- Physics

- Stochastics

- Numerics

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Heavy ion collisions, quark gluon plasma and jets
Stereotypical picture:
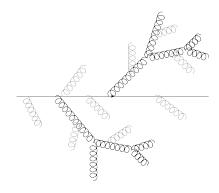
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A typical event:

- A number of $\mathcal{O}(1)$ of primary gluons emitted from leading particle.
- They then branch democratically.
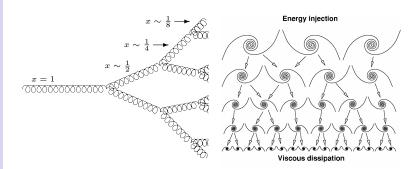- Grey gluon lines $=$ large number of non democratic, soft emissions.

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Energy cascade, wave turbulence

Jet evolution
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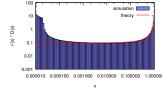QCD medium

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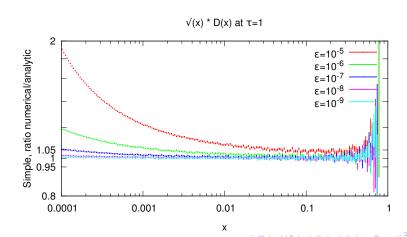
Numerical considerations, IR cutoff, pileup.

- ϵ: IR cutoff for x in kernel
- x_{min}: lowest x considered

$\sqrt{(x)} * D(x)$ at $\tau=1$

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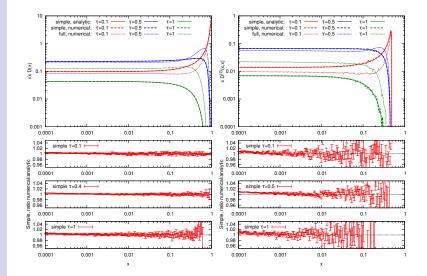
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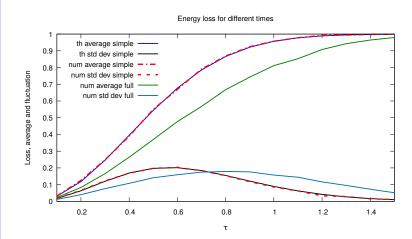Result: full kernel $\Rightarrow$ less efficient branching (will probably only have $D(x)$ and also skip ratio here)

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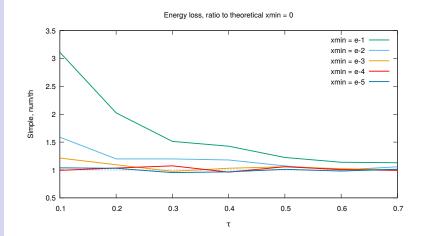QCD medium

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Energy loss: (define it here)

Energy loss for different times

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Energy loss, the effect of x_{min}

Energy loss, ratio to theoretical xmin = 0

Possible extensions:

- Things

THE END

Questions?