

WG summary: Heavy flavors in medium

Giuseppe Bruno, Christian Weiss (Conveners), 21-Dec-18

Organization of summary document

Organization by physics topics

Template: Physics topic

Present status of theory and experiments

Open questions

EIC measurements with ep/eA ←

EIC machine and detector capabilities, specific challenges ←

Synergies and complementarity with other facilities

Format of first draft

Itemized list, not full text

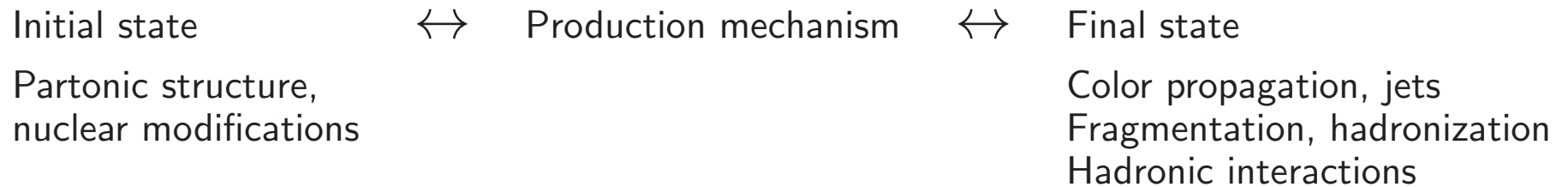
Focus on structure and content

3-4 pages, as short as possible

Heavy flavors in medium: Scope

$$\text{HF} \begin{cases} \text{open } D, B, \Lambda_{c,b}, \dots \\ \text{hidden } J/\psi, \eta_c, \Upsilon, \dots \end{cases} \quad \text{matter} \begin{cases} \text{cold} \\ \text{hot} \end{cases} \quad \text{interaction} \begin{cases} \text{high-energy } \gg 1 \text{ GeV} \\ \text{low-energy } \lesssim 1 \text{ GeV} \end{cases}$$

Schematic



Experiments and facilities

$pp/pA/AA$	LHC, RHIC, Tevatron
ep/eA	EIC \leftarrow
ep	HERA, EMC
e^+e^-	VEPP, BEPC, CESR, LEP, SLC, KEKB, PEP-II

Heavy flavors in medium: Topics

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A) HF as probe of initial-state gluons

[EIC: Nuclear PDFs from inclusive DIS eA]

↔ global analysis/PDFs

EIC: Nuclear gluon densities from open HF production in eA

EIC: Nuclear gluons from coherent HQium prodn: Transverse distns, shadowing

↔ exclusive procs/GPDs

B) Propagation and hadronization of HF in cold matter

EIC: Single-inclusive $D/B/\Lambda_{b,c}$ production in $ep+eA$

↔ light-quark fragmentation

EIC: HF jets in $ep+eA$, including substructure, correlations

↔ light-quark jet physics

EIC: Exclusive HQium production in $ep+eA$, color transparency

C) Hadronic interactions of HF mesons and baryons

EIC: Nuclear transparency in heavy meson-baryon production

EIC: Exclusive HQium production in nuclei, final-state interactions

↔ pentaquark BS

Heavy flavors in medium: Working group

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Presentations Wednesday, 19 Dec, 14:30–18:00

Ivan Vitev	(30')	14:35-15:05	Heavy flavors as probe of nuclear medium
Rongrong Ma	(30')	15:05-15:35	HF meson production at RHIC and LHC
Pietro Antonioli	(30')	15:35-16:05	HF baryon production from $e+e-$ to Pb-Pb
Christian Weiss	(25')	16:35-17:00	Open heavy flavor production and reconstruction at EIC
Peter Schweitzer	(30')	17:00-17:30	Low-energy interactions of heavy quarkonium with matter
Enrico Scomparin	(30')	17:30-18:00	Heavy quarkonium production at RHIC and LHC

Everyone interested & willing to contribute is welcome to join!

Send E-mail to giuseppe.bruno@cern.ch, weiss@jlab.org

Follow-up meeting dedicated to HF in medium: TBA