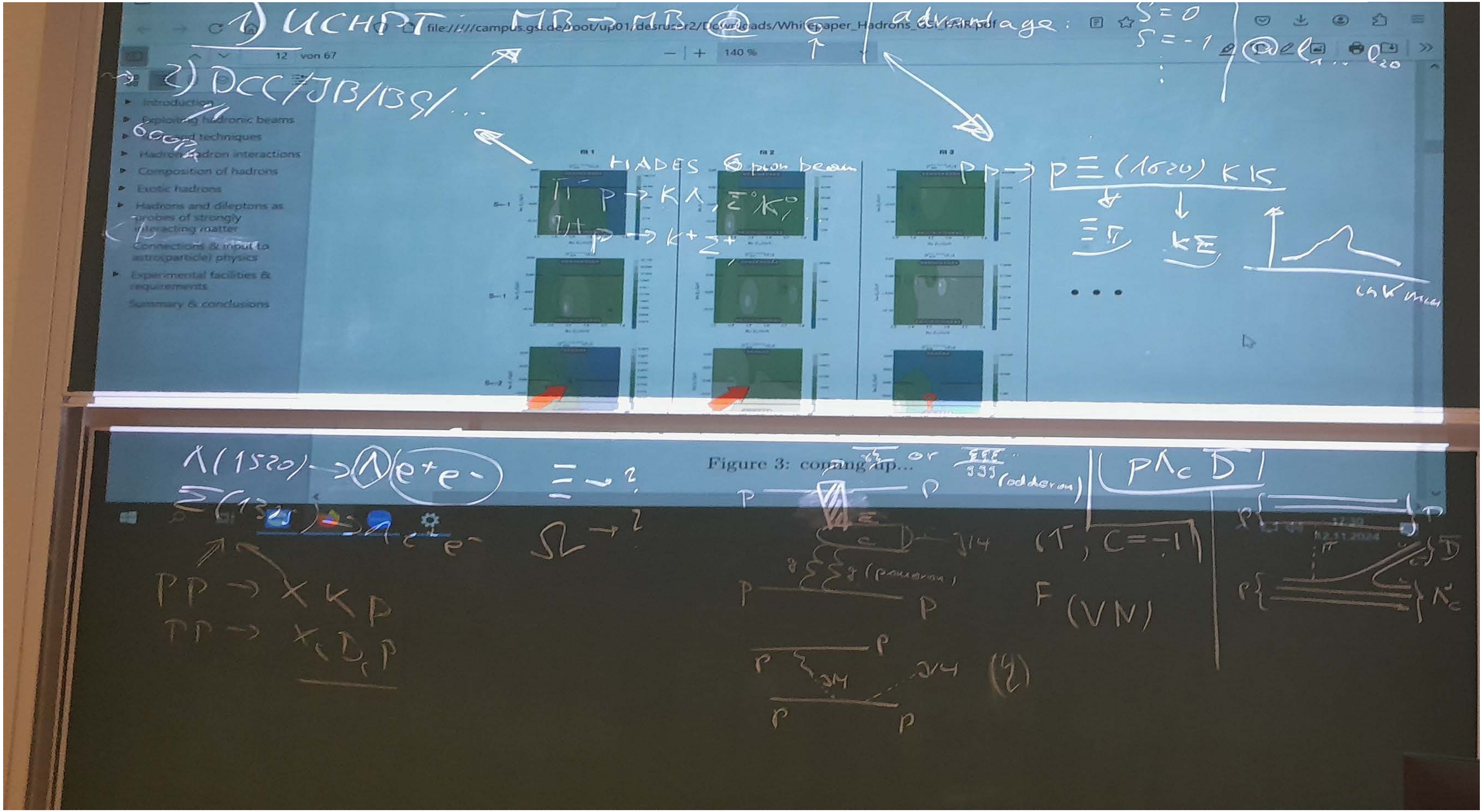
Conclusions from chapter 5 working group



Conclusions from chapter 5 working group

✓ **Spectroscopy of multi-strangeness baryons (S=-2, S=-3)/charm baryons (C=1):**

Current Status : strangeness very poor data (only ground states and very few excited states know) no progress since many years,

CBM coming into operation in 2028 can provide high quality data and make a major contribution in this domain providing :

high resolution spectroscopy of excited states , line shapes for various decay modes , differential distributions (m,t);

particularly valuable exclusive channels close to production threshold (excess energy adjustable by proton beam energy)

Studies of various Ω decays (test $\Delta I=1/2$ of selection rules, weak decays ..)

complementarity to other facilities (J-PARC, J-Lab) discussed

-> theory (DSE, EFT, UChPT) calculations feasible : extremely interesting interplay between approaches working with different d.o.f .. lattice calculations feasible

✓ **Transition form-factors in time-like region of hyperons (Daliltz decays)** :

transitions from excited to ground states (S=-1,-2,-3) unique opportunity with CBM/HADES detector at SIS100: mass distribution of virtual photon, slopes at $q^2 \approx 0$ provide access to chargé radii

(acceptance needs to be explored)

->theory : quark models, DSE (access to di-quark correlations , EFT-dispersion theory) , lattice calculation in space region (important for connection to time like region)

Conclusions from chapter 5 working group

- Charm production at threshold:

@SIS100: oportunity to contribute to unexplored region with high precision data:

exclusive channels with open ($D^{(*,0)}$ Λ_c, Σ_c D^{*0}) and hidden charm (J/Ψ) (excess range of about 2. GeV), Dalitz plots (in the function of the excess energy above threshold-openning of new decay channels, FSI, pentaquarks,..)

✓ Production mechanism : relevant degrees of freedom partonic vs hadronic , role of intrinsic charm content of nucleon -> connection to in medium effects- pA reactions(chapter 7),

comparison to photon induced reactions (J-LAB) and high energy domain (forward physics LHC) -> input for theory:

Understanding of production: important prerequisite for extraction gluonic content of nucleon, trace anomaly (origin of proton mass)

complementarity to J-PARC programe discussed

Dalitz plots: access to Charm-nucleon FSI interactions (chapter 4)

Dalitz plots: access to Pentaquarks (p-J/Ψ) , may decay also Λ_c D or Σ_c ,

other state of interest is open charm $P_{\bar{c}s}$ (possible (chapter 3)

..final steps

- Complete missiing contributins (by X-mass)
- rearange and make text smooth and allign with text with other chapters (January/February)