

Research activity in PNU-NPL

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Pusan National University



- 2021-1
연구교수 1:
김범규

박사후연구원 1:
김총

석사과정 1+2:
류재혁 + 지수정, 오종호

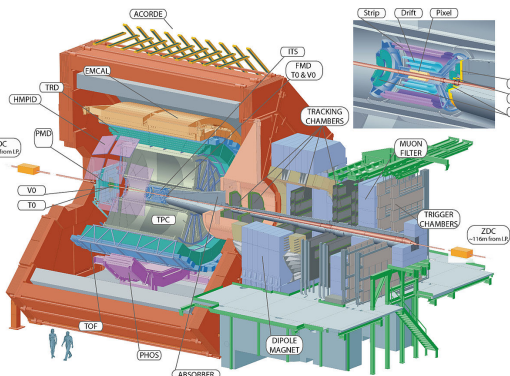
학부생인턴 4:

- 2022-1
박사후연구원 2:
김총, 송지혜

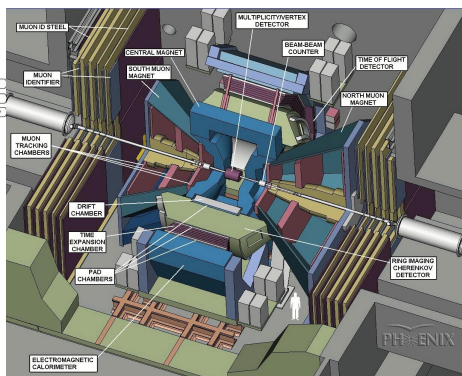
석사과정 4+2:
류재혁, 지수정, 오종호, 김용준 + 장한길, 임현지

학부생인턴 3:
김민재, 박경빈, 홍윤하

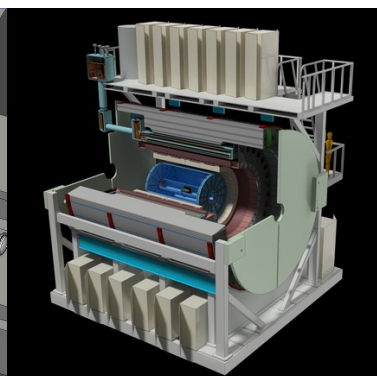
Research activity in PNU-NPL



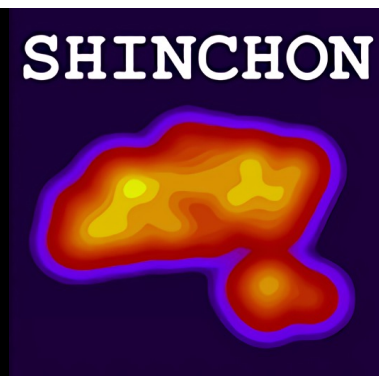
ALICE



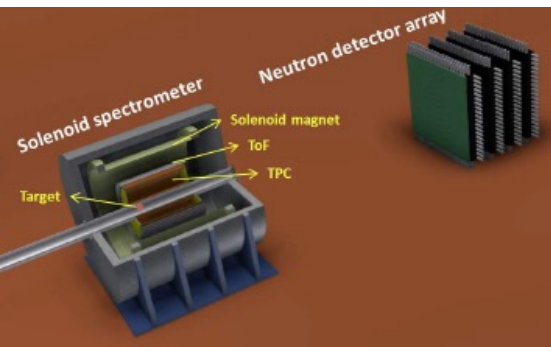
PHENIX



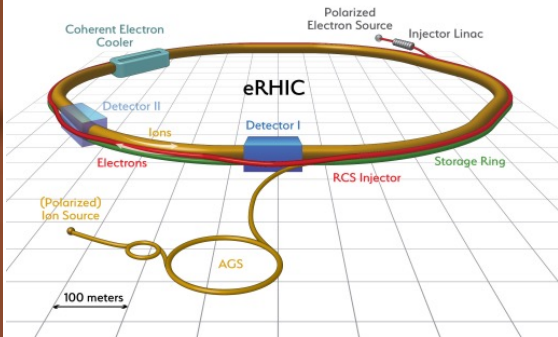
sPHENIX



Model



LAMPS



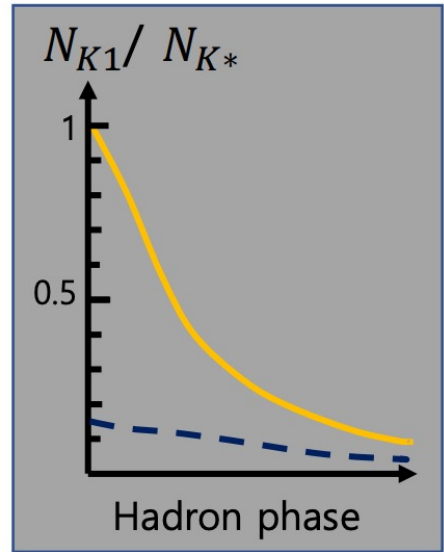
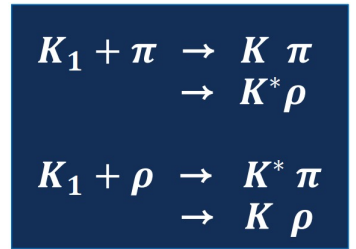
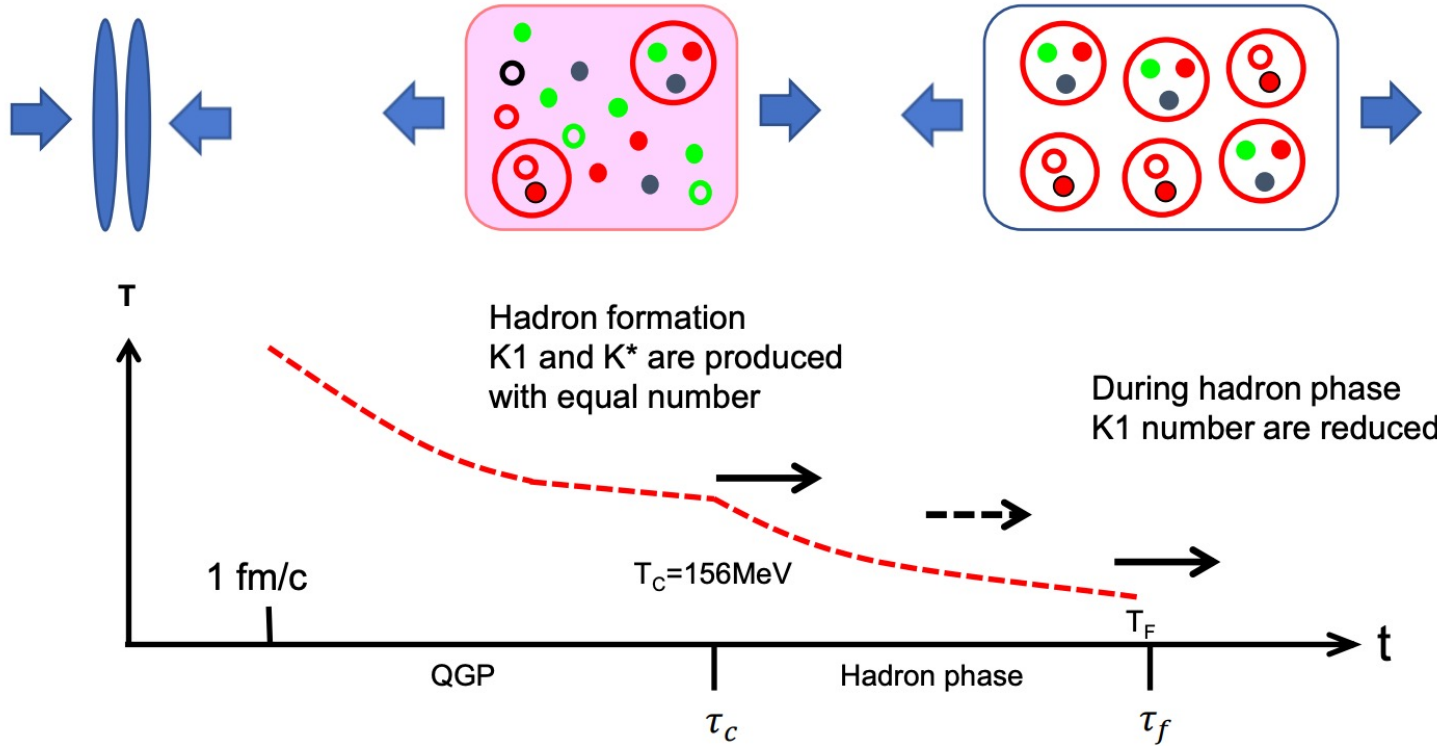
EIC

- Gluonic hot spot initial conditions in heavy-ion collisions
Published (2021/02), PRC 103, 024906
- K_1/K^* enhancement as a signature of chiral symmetry restoration in heavy ion collisions
Published (2021/06), PLB 819, 136388
- Exploring origins for correlations between flow harmonics and transverse momentum in small collision systems
Published (2021/06), PRC 103, 064906
- Exploring the string shoving model in PYTHIA8 for collective behaviors in pp collisions
Published (2021/08), JKPS 79, 447
- (PHENIX) Kinematic dependence of azimuthal anisotropies in p+Au, d+Au, $^3\text{He}+\text{Au}$ at $\sqrt{s_{NN}}=200$ GeV
Submitted, arXiv:2107.06634
- Checking non-flow assumptions and results via PHENIX published correlations in p+p, p+Au, d+Au, $^3\text{He}+\text{Au}$
Submitted, arXiv:2107.07287
- (PHENIX) Measurement of $\psi(2S)$ nuclear modification at forward and backward rapidity in p+Al and p+Au collisions
IRC2
- (PHENIX) Measurements of second-order Fourier coefficients from azimuthal anisotropies in p+p, p+Au, d+Au, and $^3\text{He}+\text{Au}$
IRC1
- (ALICE, 송지혜) Multiplicity dependent of Σ (1385) \pm and Ξ (1530)0 production in pp collisions at $\sqrt{s}=13$ TeV
IRC2
- (ALICE, 송지혜) Sigma0 and anti-Sigma0 Production in pp Collisions at $\sqrt{s}=7$ TeV at the LHC with ALICE
IRC2

K1/K* enhancement as a signature of chiral symmetry restoration in heavy ion collisions

Slides from Haesom Sung at ATHIC

- Chiral Partner Particles: K_1 (1270) and K^* (890)

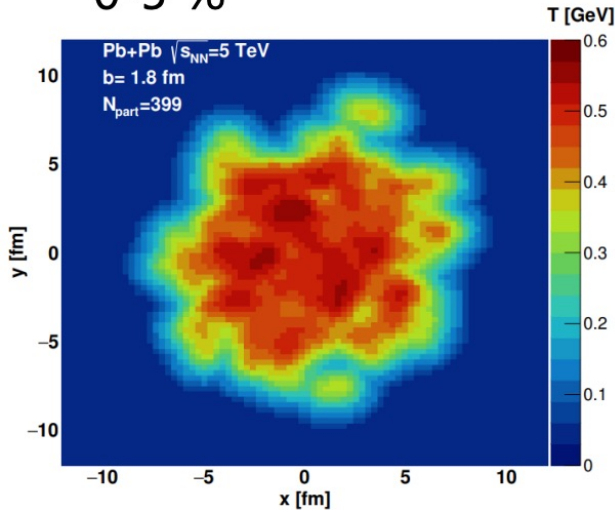


K1/K* enhancement as a signature of chiral symmetry restoration in heavy ion collisions

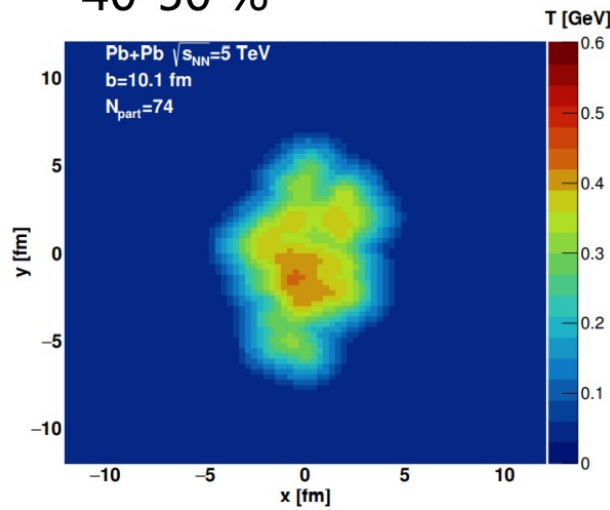
Slides from Haesom Sung at ATHIC

- Chiral Partner Particles: K_1 (1270) and K^* (890)

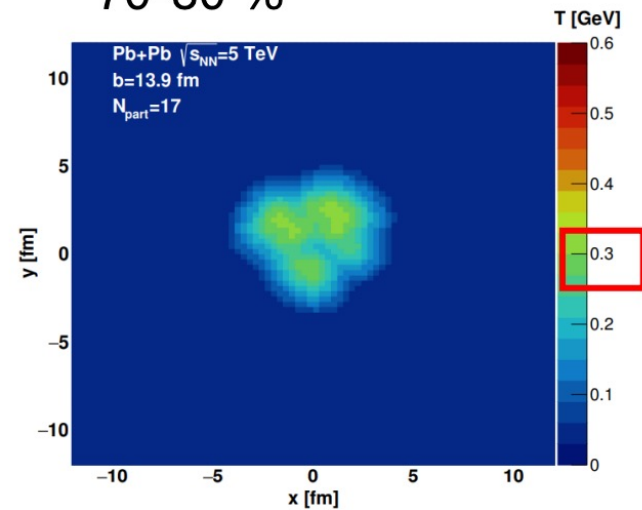
0-5 %



40-50 %



70-80 %



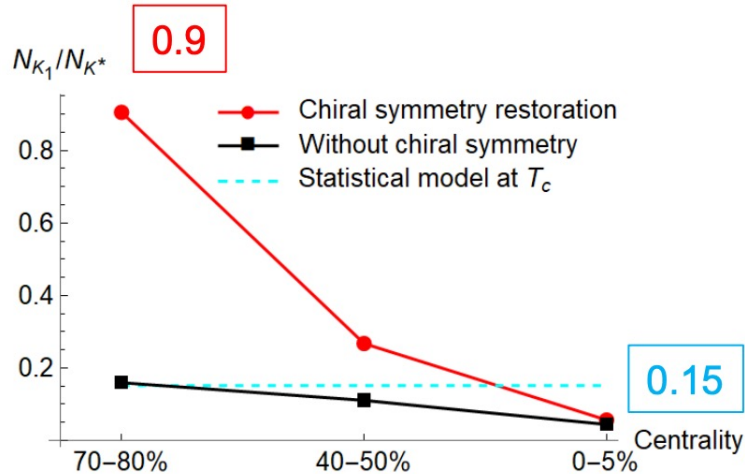
The fraction of initial energy where the temperature is higher than **156MeV** is larger than **98%** in all three centrality ranges.

K1/K* enhancement as a signature of chiral symmetry restoration in heavy ion collisions

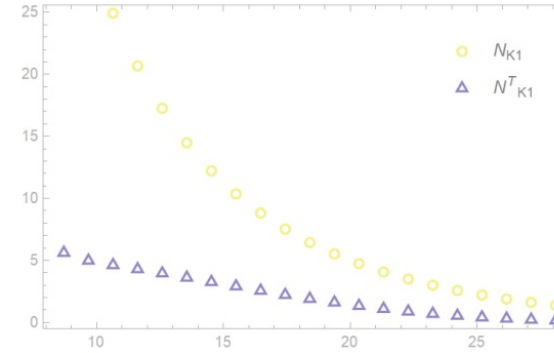
Slides from Haesom Sung at ATHIC

- Chiral Partner Particles: $K_1(1270)$ and $K^*(890)$

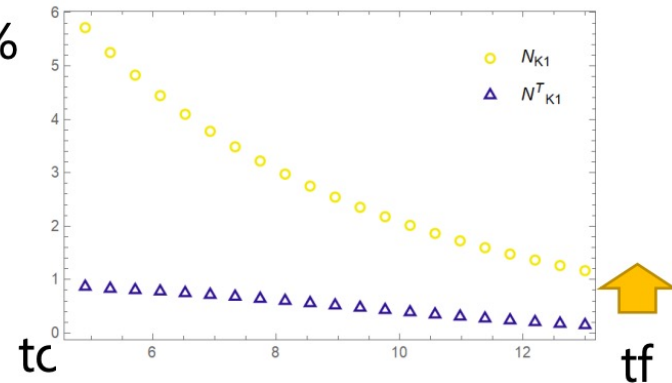
$T_c = 156 \text{ MeV}$	t_c (fm/c)	t_f (fm/c)	R (fm)	v (c/fm)	a (c^2/fm)	α
0 – 5%	8.7	28.1	14.9	0.93	0.04	0.835
40 – 50%	4.9	13	7.8	0.78	0.052	0.9
70 – 80%	2.2	2.9	4.43	0.481	0.161	0.847



0-5 %



40-50 %



- 국내 학회

- 2021/04, KPS(지수정): Study on long-range two-particle correlation in pPb collisions in ALICE
- 2021/04, KPS(오종호): Study of multiplicity dependent J/ψ and $\psi(2S)$ production in pp collisions
- 2021/04, KPS(김용준): Simulation study on beam test at KOMAC of prototype detectors for LAMPS
- 2021/04, KPS(이상윤): Model study on the collective behavior in small collision systems
- 2021/04, KPS(류재혁): Measurement of jet fragmentation function in ALICE
- 2021/04, KPS: Study of Monte Carlo simulation for quarkonia production in heavy-ion collisions
- 2021/06, 부울경 지부학회: 고에너지 강입자 충돌에서 생성되는 새로운 물질 - 쿼크 글루온 플라즈마
- 2021/10, KPS(김충): Luminosity estimation via van der Meer Scan in ALICE
- 2021/10, KPS(지수정): Study on the flow of the identified particles in p-Pb collisions
- 2021/10, KPS(류재혁): Study of differential jet fragmentation in pp and p-Pb collisions at ALICE
- 2021/10, KPS: Study of partonic structure of nucleon and nucleus at the Electron Ion Collider
- 2021/10, KPS(김용준): Simulation study of dual-readout calorimeter for the ECCE experiment at the Electron Ion Collider
- 2021/10, KPS(류재혁): Study of jet measurements with a dual-readout calorimeter for the EIC
- 2021/10, KPS(박우형): Simulation study of b-jet tagging algorithms for sPHENIX at RHIC
- 2021/10, KPS: Study of the nuclear skin with the LAMPS detector

- 국제 학회
 - 2021/04, JPS: Various flavors in quark gluon plasma
 - 2021/07, ISMD: Study of kinematic dependence of azimuthal anisotropies in p/d/³He+Au collisions at PHENIX
 - 2021/07, PSQ@EIC: Silicon detector activities in Korea
 - 2021/07, HADRON(김충): Luminosity determination with ALICE at the LHC
 - 2021/09, PANIC(김충): Luminosity determination in ALICE
 - 2021/11, ATHIC(송지혜): System size and energy dependence of resonance production
 - 2021/11, ATHIC: Collectivity in small collision systems
- 2022/04, QM
 - Exploring origins for correlations between flow harmonics and transverse momentum in small collision systems
 - Checking Non-Flow Assumptions and Results via PHENIX Published Correlations in p+p, p+Au, d+Au, ³He+Au at 200 GeV
 - (sPHENIX) Study of heavy-flavor jet measurements with sPHENIX
 - (PHENIX, 오종호) Study of multiplicity dependent J/ψ and $\psi(2S)$ production in p+p collisions with PHENIX
 - (ALICE, 류재혁) Measurement of the transverse momentum distributions of charged-particle jet fragments in pp collisions
 - (ALICE, 지수정) Flow measurements via two-particle correlations in small systems with ALICE
 - (ALICE, 송지혜) Production of $\Xi(1820)$ in different collision systems at the LHC energies
 - (ALICE, 김충) Multiplicity dependent Ξ_c^0 production in pp collisions at 13 TeV
 - (ECCE, 김용준) Dual-readout Calorimeter for the EIC

- ALICE
 - Data analysis
 - Xic0 in high multiplicity pp: 김총
 - Xi(1820) in pp, pPb, PbPb: 송지혜
 - Jet fragmentation in pp: 류재혁
 - Identified hadron flow in pPb: 지수정
 - Searching for new topic in LF
 - Service work
 - Luminosity (long-term)
 - ITS3
 - Test beam analysis framework (long-term)
- sPHENIX
 - b-jet analysis framework
- PHENIX
 - J/psi and psi(2S): 오중호
 - Flow in small systems
- LAMPS
 - KOMAC beam test
 - System integration and simulation
 - Forward tracker upgrade
 - Prototype with scintillating fiber
 - Software
 - Simulation and reconstruction framework
- EIC & FCC
 - Dual-Readout Calorimeter
 - Simulation framework: 김용준
 - Silicon detector (TBD)
- Model study
 - SHINCHON
 - Flow and jet modification in small systems
 - Hadronic rescattering