



Review of KoALICE Experiment Group in 2019 & Future plan

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Professor

Inha University

- ✓ 데이터 분석을 통한 쿼크물질상태 연구
- ✓ 검출기의 유지/보수/운영/테스트를 통한 ALICE 실험 참여
- ✓ ALICE 검출기 업그레이드 연구개발참여를 통한 국제적 기여 및 국내 인프라 구축

→ **인력양성**

<5단계 목표>

국제 무대에서의 **KoALICE recognition** 제고
검출기 센서기술을 활용하여 **LS2**에 주도적 참여



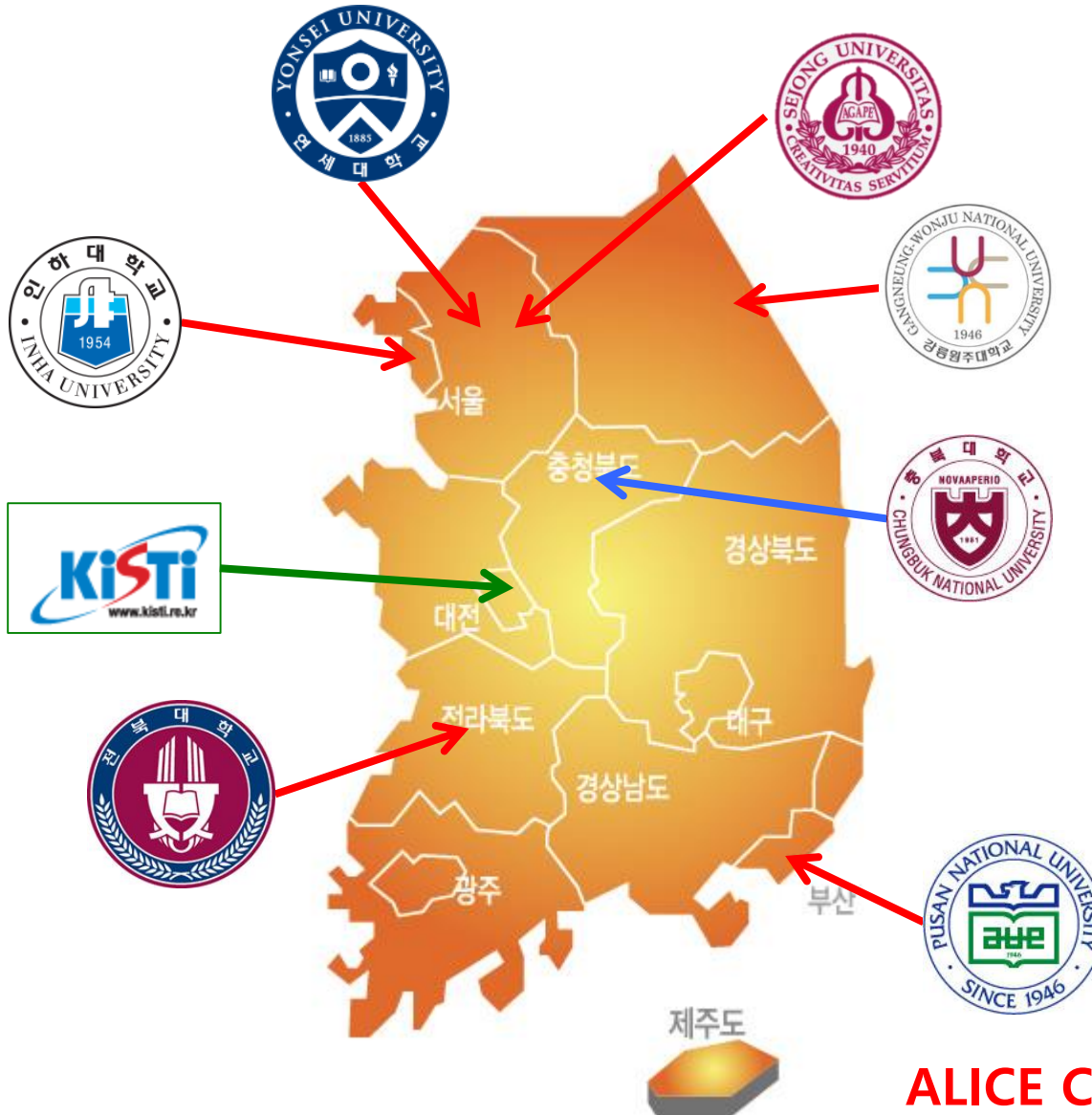
KoALICE

Participants (32)

- 7개대학
- 교수급 : 10
- 박사후 연구원 : 5
- 대학원생 : 16
- 기타 : 1

****다른 소스 참여기관**

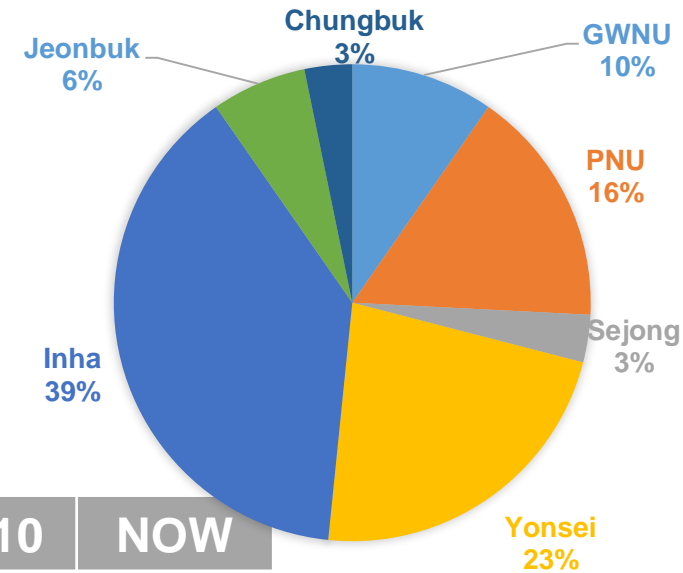
- KISTI



ALICE CB - 충북대 신규 가입 승인

Members

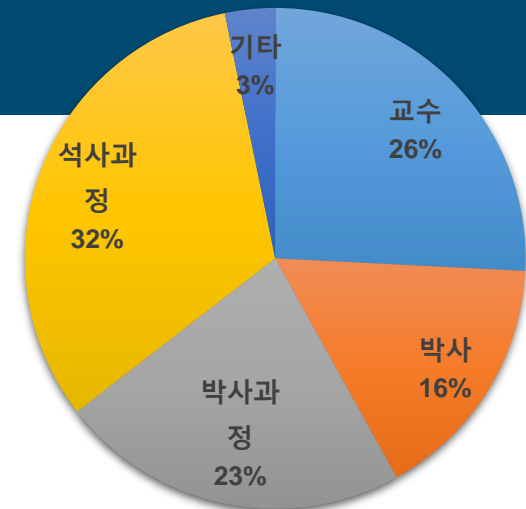
- ✓ **Steady** even though the number of participating institute increasing



Institute	2016-10	2017-10	2018-10	2019-10	NOW
PNU	9	6	7	7	5
GWNU	1	1	2	2	3
Sejong	2	2	2	1	1
Yonsei	10	7	9	6	7
Inha	10	11	10	13	12
Jeonbuk	-	1	2	2	2
Chungbuk				1	1
Total	32	28	32	32	31

Members

✓ 학생수 ≈ 박사급연구원수



	합계	비율	강릉원주	부산	세종	연세	인하	전북	충북
교수	8	26%		2	1	1	2	1	1
박사	6	19%	2	0			3		
박사과정	7	23%		1		2	3	1	
석사과정	9	29%	1	2		4	3		
기타	1	3%					1		
TOTAL	31	100%	3	5	1	7	12	2	1
%	100%		10%	16%	3%	23%	39%	6%	3%

Members

✓ 학생 인력 변화

Institute	2016-10	2017-10	2018-10	2019-10	NOW
PNU	4	4	4	4	3
GWNU	0	0	0	0	1
Sejong	0	0	0	0	0
Yonsei	8	5	7	5	6
Inha	6	5	4	6	6
Jeonbuk	-	0	1	1	1
Chungbuk	-	-	-	0	0
Total	18	14	16	16	16

Member Activity

✓ **New member :**

- **노서영(충북대), 임상훈(부산대)**
- **복정수(인하대), 도재현(인하대), 홍건희(연세대)**
- **한용훈(연세대), 조재윤(인하대), 권경현(강릉원주대)**

✓ **Dr. V. Kucera received a CERN fellow, starting from Jan. 2020.**

✓ **1 summer student from Korea : 권민재 (부산대)**

✓ **M&O-A for 2020 : 14 (+2)**

✓ **JH Yoon served as a member of ALICE CB chair search committee until
08/2019 : Silvia Masciocchi**

Produced man power & Publications

✓ Ph. D.

- 2016. 8 : 김민우 (연세대)
- 2017. 2 : 송명근 (연세대)
- 2018. 2 : 송지혜(부산대), 김태수(연세대)
- 2019. 8 : 김현중(연세대)

✓ MS

- 2016. 8 : 김민정 (인하대)
- 2017. 2 : Qiulian Yang, Dan Liu (연세대)
- 2018. 2 : 방혜선, 권지연, 허경범(인하대), 정재호, 김태준 (연세대)
- 2019. 8 : 이상현(부산대)

✓ 2019년 전체 논문 42편 중 주저자 논문 6편

- ALICE 공동 논문 36편 중 주저자 논문 2편

1. “ALICE results on system-size dependence of charged-particle multiplicity density in p–Pb, Pb–Pb and Xe–Xe collisions” : NPA 982 (2019) 279, 김범규
2. “Centrality and pseudorapidity dependence of the charged-particle multiplicity density in Xe-Xe collisions at $\sqrt{s_{NN}} = 5.44$ TeV” : PLB 790 (2019) 35, 김범규

- 주저자 논문 1편 기 투고

1. “Global polarization of Lambda and anti-Lambda hyperons in Pb-Pb collisions at 2.76 and 5.02 TeV” : Submitted to PRC (2019), 백용욱

- 한국 단독 주저자

1. “Studies of a thermally averaged p-wave Sommerfeld factor” : PLB 795, 469 (2019.06) 김세용
2. “A Dynamic Programmable Network for Large-scale Scientific Data Transfer using AmoebaNet” : Applied Science Journal vol 9, 4541(2019.10) 노서영

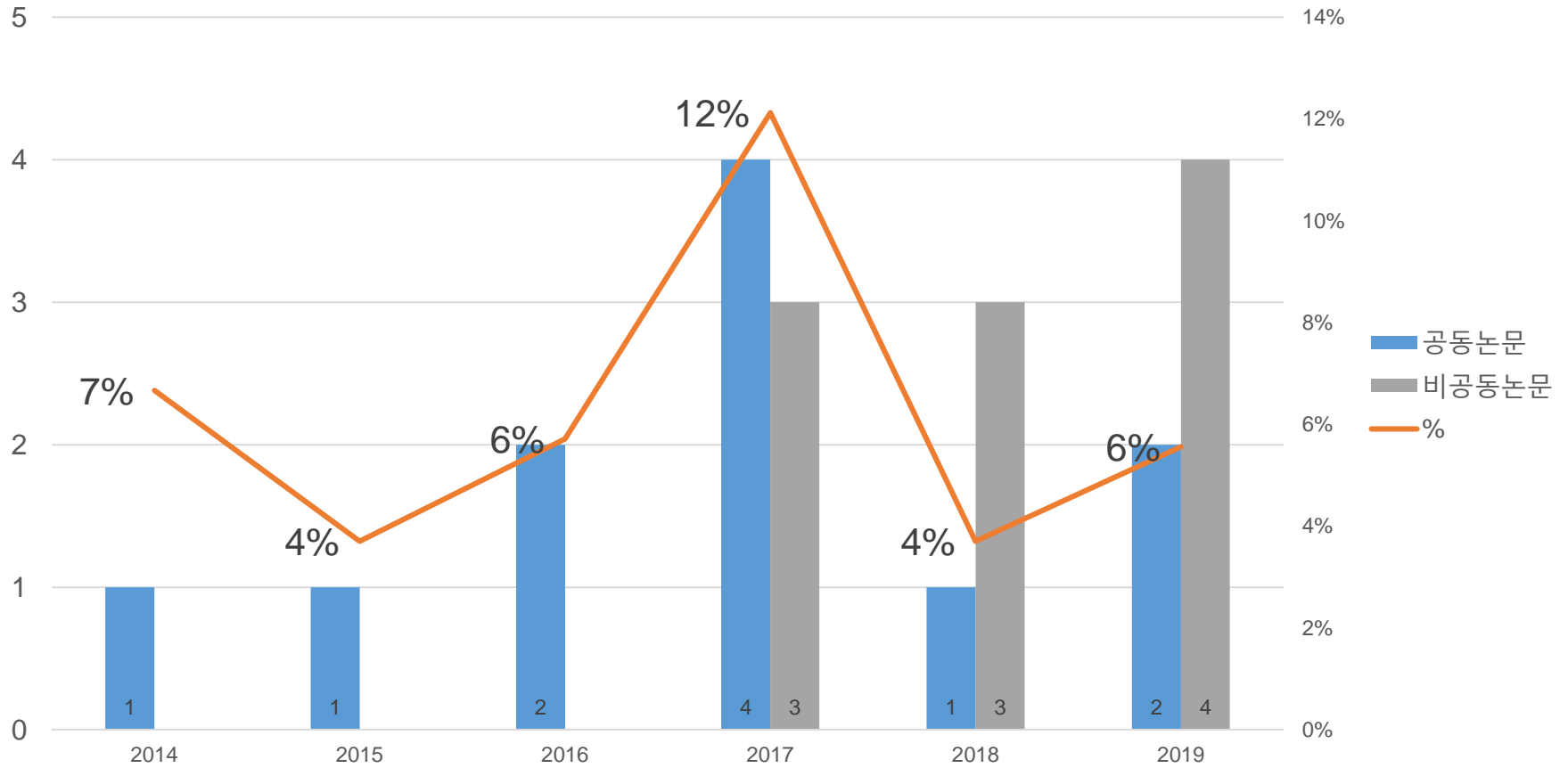
✓ 2019년 전체 논문 42편 중 주저자 논문 6편

- Collaboration Work를 통한 논문은 3편 출판

1. “Study of the ecological gas for MRPCs” : NIM A927 (2019.5) 백용욱 외 2인
2. “Study of a large size double stack MRPC with strip readout” : NIM A927 (2019.6) 백용욱 외 2인
3. “Study of a large strip-type MRPC with single-ended readout” : NIM A940 (2019.10) 백용욱 외 1인

Publications

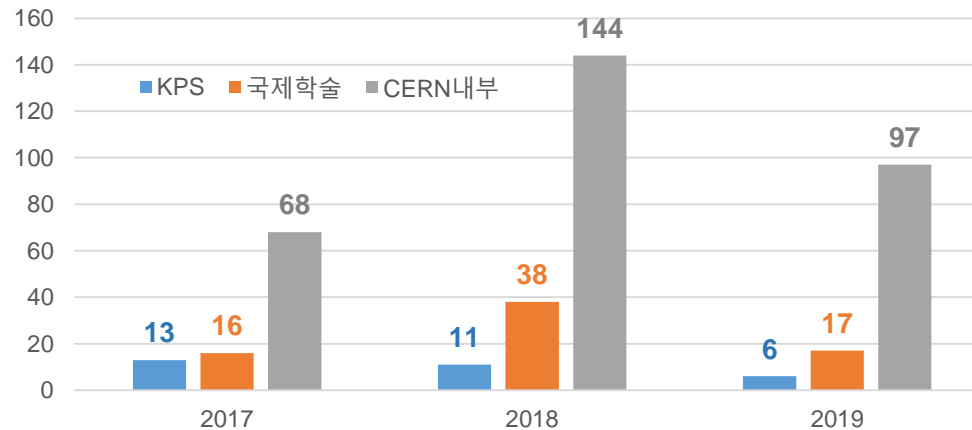
주저자 논문수 년도별 추이



✓ Total : 121

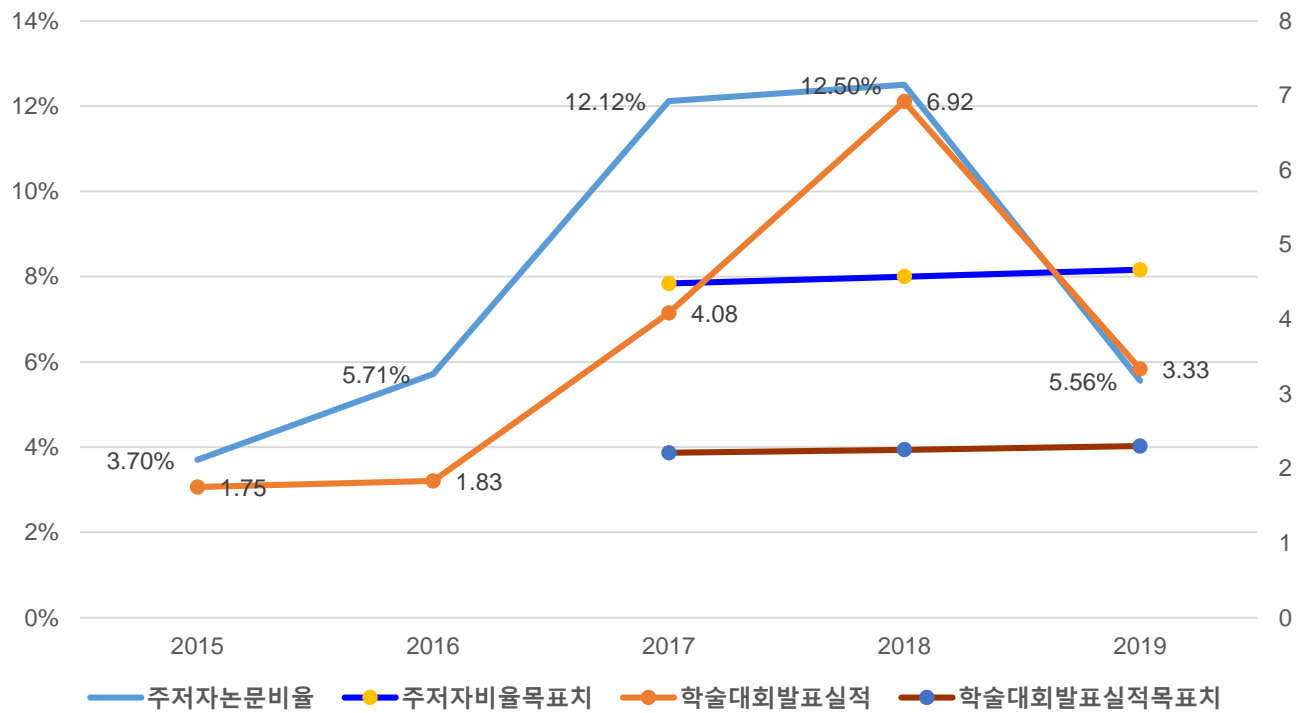
- 17 International conference
- 21 domestic : KPS and HIM
- **97 CERN internal** in PAG, PWG, PF, AW

학술대회 발표



성과지표관리

성과지표



Paper Expectation in 2020

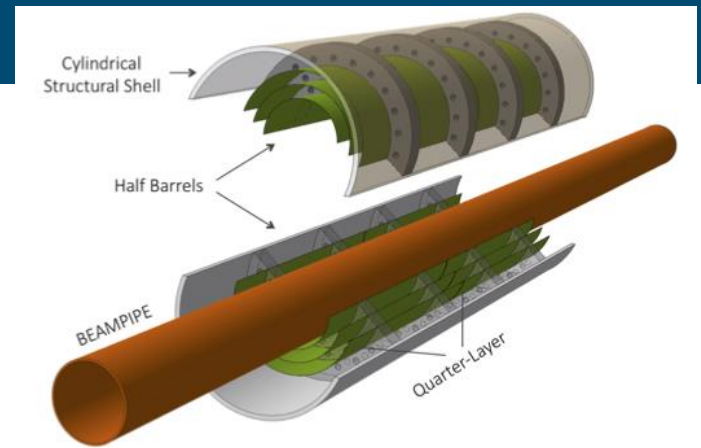
Title	PC	Status
PWA	BK Kim, TS Kim	Under IRC review Submitted
Global polarization in PbPb	YW Baek	
K0_s and Lambda in jets	Vir Kucera	
pp multiplicity	BK Kim, YW Baek	
Jet Jt	BK Kim	
Sigma0 in Pb-Pb	JH Song, IK Yoo	
Path-length dependent I_AA	HJ Kim	Analysis ongoing QM
Sigma0(1530) in pp	BH Lim	
f0(980) and f2(1270) in pp	JL Lee	
Ridge in pp	JL Lee	
Lambda_b in pp	TJ Kim	
Ξ^0_c in pp at 13 TeV	JJ Seo	
B2e in pp	JY Kweon	
B2e R_AA	Jonghan Park	

LS2 upgrade : ITS Reception Test for ML & OL

- ✓ Mass Chip Test (100% in Korea)
- ✓ HIC (Hybrid Integrated Circuit) Assembly (한국을 포함한 세계 5개국)
- ✓ Stave Assembly (Stave Site)
- ✓ Reception Test (CERN)
 - Visual Inspection
 - Stave response test with pulse
- ✓ Layer Construction (CERN)
- ✓ 박종한, 임봉휘, 권지연, 서진주, 정지혜, 김태준



✓ Novel and flexible silicon detector



- Chip design and development
- Chip characterization through Silicon Sensor simulation
- Quality improvement through Physics simulation
- vertex resolution optimization and tracking through software development
- Suggest NEW experiments : Fixed target exp. or Triplet collision.
- Production of new detector : Curved ITS, Silicon only detector ...
- characteristic study of **MRPC** (GWNNU)

Status of Common Fund and cash contribution

	item	~'15 paid	'16	'17	'18	'19	Total Sum
A	CF	"K',	"K',	"K',	"K',	"K', [✓]	K [✓] , [✓]
B	ITS cash	,K''β	""	""	""	-β',	-.
C	ITS in-kind	,	~K	~K	~K	~K	, [✓]
B+C	ITS total	,K''β	""K	""K	""K	""K	K [✓]
A+B	Cash total	, [✓]	""K',	""K',	""K',	β [✓] , [✓]	, [✓] , [✓]
	Contribution total	, [✓]	"Kβ',	"Kβ',	"Kβ',	"" [✓] , [✓]	"" [✓] , [✓]

CF & ITS Contribution : All paid

2021-2022년 M&O-B : 한국 기여분 23 kCHF (6.4%)

Budget

✓ 2019 년도 예산 : 11.44 억원

2020년도 : 0.72억 증액 → 총 12.16 억원

✓ 2020년도 달라지는 것들

- 체재비 : 4300→4500 / 2800→3000 / 2500→2700 (박사후/박사과정/석사)
- 인건비 : 박사후연구원 200 → 250만원

✓ KiAF

- CPU : 200+200=400 core
- DISK : 800+500=1300 TB

KoALICE Curve

