

Curriculum Vitae

简历

Cong GENG

Personal data (个人信息)

Given Name, Surname: Cong, Geng (姓名: 耿聪)
Date and country of birth: 28-03-1986, China (1986年3月28出生于中国安徽)
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Education and Working experiences (学习工作经历)

Aug. 2014 – Present *Postdoctoral Research Fellow* in the Department of Physics in University of Michigan (USA), full time participating in the ATLAS experiment in Large Hadron Collider (LHC). (美国密西根大学博士后, 参与欧洲强子对撞机上ATLAS实验的相关物理工作。)

Sep. 2008 – Jul. 2014 *Ph.D. degree* in particle physics in University of Science and Technology of China (Hefei, Anhui Province, China), participating in the BESIII experiment at Beijing Electron and Positron Collider (BEPCII). (中国科学技术大学粒子物理专业博士学位, 博士期间参与北京谱仪上相关的物理分析工作。)

Nov. 2012 – Mar. 2013 *Visiting Scholar* in University of Hawaii (USA) (美国夏威夷大学访问学者)

Sep. 2004 – Jul. 2008 *Bachelor degree* in nuclear and particle physics, University of Science and Technology of China, the title of thesis is “The study of high-rate MRPC”. (中国科学技术大学核与粒子物理专业学士学位, 毕业论文题目:《高计数率MRPC的研究》。)

Honors and Awards (荣誉, 奖励)

- Excellence Award of President of Chinese Academy of Sciences (中国科学院院长奖-院长优秀奖)
- National Scholarship for Excellent Doctor student (国家奖学金 (博士))
- Outstanding doctoral thesis support program (优秀博士论文支持项目)
- “Qiu Shi” Graduate Student Scholarship (Qiu Shi Science and Technology Foundation) (求是基金会“求是”研究生奖学金)
- “Best Poster Presentation Award” in the “3rd Hope Meeting” (in Japan) (日本“第三届希望会议”最佳墙报奖)
- Scholarship Award for Doctoral Student (Funding) (博士生奖学金-项目基金)
- Graduate Innovation Fund (研究生创新基金)
- National Encouragement Scholarship (国家励志奖学金)

Research Activities (所从事研究简介)

Ph.D. researches in BESIII experiment

I conducted my research based on the BESIII (Beijing spectrometer) experiment at BEPCII collider since the year of 2009. My research is mainly using the data samples of J/ψ and ψ' to search for new decay modes of charmonium below open charm mass threshold. At the same time, I was also actively doing analysis to search for the excited state of Z_c according to the prediction on its strong coupling to $D^{(*)}D^{(*)}$, which could help to understand the features of four-quark hadrons and related QCD theory.

During the five-year Ph.D. period, I published 5 papers for these related physics in high-quality international journals. One of them, which is about the Z_c physics, was published on Physical Review Letters and highlighted as “Editor’s Suggestions”.

Others were all published in Physical Review D. All these physics results were also reported in the international conferences, bringing many and discussions and interests.

(自2009年,我在BEPCHII对撞机上的北京谱仪实验开展研究工作。研究工作中,我主要利用 J/ψ 和 ψ' 的数据来寻找粲介子产生阈以下粲偶素新的衰变模式。同时,根据 Z_c 与 $D^{(*)}D^{(*)}$ 的强耦合预言,我也积极参与了寻找 Z_c 激发态的物理工作。这一工作可以帮助我们更好的理解四夸克态的性质以及相关的QCD理论。

在博士的5年工作期间,我在国际高质量的物理期刊上发表了5篇相关文章。其中相关 Z_c 的物理工作发表在美国的《物理评论快报》上,并且是被标记为“编辑建议”的文章。其他的工作都发表在《物理评论D》上。同时,这些工作在国际会议上也被多次报告,引起了很多的讨论和兴趣。)

Postdoctoral Research in ATLAS experiment

Since August 2014, I joined the team of University of Michigan and participated in the ATLAS experiment. I am focusing on the physics related with Standard Model (SM) Di-boson ZZ production and Higgs property measurement with ZZ decay mode. Z boson is the elementary particle which transmits the electroweak force, thus the di-boson ZZ production is the very typical process in Large Hadron Collider. Deep studying of di-boson ZZ could shed light on the electroweak interaction. Another motivation is to increase the precision of Higgs property measurement because the Higgs ZZ decay mode is the clean channel and SM continuum ZZ production is the dominant background source. Furthermore, Higgs coupling to vector bosons and the Higgs mechanism contribute the unitarity property in the TeV energy scale, which motivate us to study the di-boson with more statistics and higher energy.

Before the end of 2017, we already published three papers with RUN2 data. One of papers, where I am the analysis contact, was published in Physical Review Letters for the di-boson ZZ production measurement at 13 TeV. It was the milestone paper which was the first SM physics result in ATLAS RUN2 period running at 13 TeV. We have another two papers submitted to international journals, and more than five papers under collaboration review and close to submission. I am playing the contact role or leading contribution in these publications.

Besides the analysis, I contribute to the service work of Muon Chamber MDT Gas Monitor System maintenance and daily on-call job. At the same, I am also the team member of official analysis frame (with name “QuickAna”), which has been widely used e.g. Higgs and SM analysis in ATLAS collaboration.

(博士后期间,自2014年8月,我加入美国密歇根大学研究组,同时进入ATLAS实验项目。我主要开展关于标准模型下双玻色子 ZZ 产生的物理工作,以及利用 ZZ 衰变末态

来研究希格斯粒子物理性质。 Z 玻色子是传递电弱相互作用的基本粒子，因此双玻色子 ZZ 的产生是大型强子对撞机上非常典型的物理过程。双玻色子 ZZ 的深度研究可以帮助理解电弱相互作用。另外，由于标准模型过程 ZZ 是希格斯到 ZZ 衰变模式最主要的本底，对于标准模型 ZZ 过程的理解可以提高希格斯粒子的性质测量精度。还有，希格斯粒子机制可以解释 TeV 能量尺度下双玻色子非发散性质，利用更高统计量更高能量的样本有助于我们理解这一物理现象。

2017年之前，利用 RUN2 期间的数据，我们已经发表了 2 篇文章。其中一篇文章报告了双玻色子 ZZ 过程的测量，发表在美国的《物理评论快报》上，这是 ATLAS 合作组内 RUN2 期间第一篇关于标准模型的物理结果，我是这个物理工作组的分析联系人。目前，我们两篇相关文章已经提交国际杂志，还有超过 5 篇文章正在合作组内评审，很快就将提交国际杂志。我在这些工作内一直是物理分析“联系人”等相关重要角色。

除物理分析外，我还对 Muon Chamber 上面 MDT 气体检测系统进行长期的维护工作，并且还是相应系统的日常 on-call。同时，在软件方面，我还是物理分析框架“QuickAna”小组成员，参与长期的维护工作。）

Publications (作为主要贡献者所发表文章)

- $ZZ \rightarrow \ell\ell'\ell'$ cross section measurements and search for anomalous triple gauge couplings in 13 TeV pp collisions with the ATLAS detector, (ATLAS Collaboration), arXiv:1709.07703, submitted to PRD.
- Search for an invisibly decaying Higgs boson or dark matter candidates produced in association with a Z boson in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector, (ATLAS Collaboration), Phys. Lett. B 776 (2017) 318 (**Analysis Contact**)
- Measurement of inclusive and differential cross sections in the $H \rightarrow ZZ^* \rightarrow 4\ell$ decay channel in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector, (ATLAS Collaboration) J. High Energ. Phys. (2017) 2017: 132
- Measurement of the ZZ production cross section in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector, (ATLAS Collaboration) Phys. Rev. Lett. 116, 101801 (2016) (**Analysis Contact**)
- Cross section measurement of $e^+e^- \rightarrow \eta J/\psi, \pi^0 J/\psi$ at energies between 3.81 and 4.42 GeV at BESIII, (BESIII Collaboration) Phys. Rev. D 91, 112005 (2015)
- Observation of $Z_c(4040)$ in $e^+e^- \rightarrow D^*D^{*-}\pi^+$ process at 4.26 GeV, (BESIII Collaboration) Phys. Rev. Lett. 112, 132001 (2014) (**Analysis Contact**)

- Measurements of $\psi' \rightarrow \bar{p}K\Sigma$ and $\chi_{cJ} \rightarrow \bar{p}K\Lambda$, (BESIII Collaboration) Phys. Rev. D 87, 012007 (2013) (**Analysis Contact**)
- Observation of η_c decay into $\Sigma\bar{\Sigma}$ and $\Xi\bar{\Xi}$ final states, (BESIII Collaboration) Phys. Rev. D 87, 012003 (2013)
- Observation of χ_{cJ} decaying into the $p\bar{p}K^+K^-$ final state, (BESIII Collaboration) Phys. Rev. D 83, 112009 (2011) (**Analysis Contact**)

Conference, Workshop, Seminar (重要会议记录)

09/2017 Particle & Nuclei International Conference 2017 (PANIC17), China National Convention Center, Beijing, China, a talk with the title “Diboson Production, vector boson fusion and vector boson scattering measurements with the ATLAS detector”

08/2016 QCD@LHC 2016, Zurich, Switzerland, a talk with the title “BSM decays of the SM Higgs (rare decays, NMSSM, H?invisible etc.) + non resonant di-Higgs results at LHC”

10/2015 ATLAS Physics Jamboree, CERN, a talk with “EWK Physics”

08/2015 Meeting of the Division of Particles & Fields of the APS (DPF2015), University of Michigan, USA, a talk with the title “Physics prospects of the ZZ production measurements with the ATLAS experiment at the first year of LHC Run 2”

02/2015 ATLAS Standard Model Workshop, Annecy, France, a talk with the title “Prepare $ZZ \rightarrow 4\ell$ Cross Section Measurement with the first 1 fb^{-1} data in Run2”

11/2014 IEEE NUCLEAR SCIENCE SYMPOSIUM and MEDICAL IMAGING CONFERENCE, a poster with the title “Online precision gas evaluation of the ATLAS muon spectrometer during LHC Run I” .

07/2011 19th Particle & Nuclei International Conference 2011 (PANIC11), Massachusetts Institute of Technology (MIT), Cambridge, USA, a talk with the title “Recent Charmonium Results at BESIII Experiment”

03/2011 3rd Hope Meeting and present the latest physics results of BESIII, Grand Prince Hotel New Takanawa, Tokyo, Japan

08/2010 Hadron physics Summer School 2010 (HPSS2010), Physikzentrum, Bad Honnef, Germany