

Response to comments and recommendations from the 2016 JPAC review

Comments

1. JPAC is performing essential work relevant across the full range of JLab's experimental effort; this effort requires substantial JPAC manpower. Current support comes from JLab, IU and GWU, while additional postdoc support for JPAC from the JLab theory pool is merited.

The JLab theory group has been very supportive of JPAC, both in terms of supporting postdocs, visitors and facilitating collaborations.

2. The effectiveness of JPAC could be enhanced by building up a teaching resource for new members consisting of written materials and videos of lectures. This is partly done but could be improved and extended.

A large database of resources (including papers, books, notebooks, lecture videos) has been created. A dedicated course in Scattering Theory was created in collaboration with several institutions including U.Bonn, U.of Messina, U.of Barcelona, UNAM, and has been offered on a regular basis.

3. The postdocs and students expressed the desire for semiannual JPAC meetings of 1-2 weeks duration. This would allow for educational lectures, presentations of ongoing research, and most importantly, the opportunity for sharing experiences and brainstorming on future projects. In addition, members of CLAS-12, GlueX, and other relevant experimental collaborations could be invited.

To the extent possible, we have organized dedicated JPAC meetings, for example at UNAM (Mexico) in 2017, ECT* (Trento) in 2019, Munich (Germany) in 2021. We also make sure there is JPAC presence at workshops and conferences. Our weekly zoom meetings have been running uninterruptedly for 10 years, and also served as an opportunity for broader physics discussions.

4. The summer school on reaction physics was very successful and should be continued, possibly biennially. This is a vehicle for integrating new members into JPAC, for spreading the expertise more widely, and for building connections with experimentalists.

The pandemic interrupted the schedule, nevertheless we did organize virtually the National Nuclear Physics Summer School (from UNAM, Mexico) and the Global Classroom Reaction Theory course (from IU, USA).

5. Efforts to expand the funding base of JPAC beyond its current distributed sources are encouraged. Given the international nature of the effort, this could include non-US sources. Efforts to expand JPAC contributions from other universities are encouraged.

JPAC members have been successful in securing multiple grants. For the full list see <https://www.jpac-physics.org/statistics/achievements>.

6. The integration of JPAC expertise and formalism with those of the HadSpec lattice QCD collaboration is encouraged. It is likely that a combined effort will be required to relate upcoming experimental data on resonances to ab-initio QCD computations. This is particularly essential for resonances with decays to more than two stable particles (e.g., most exotics).

JPAC members have established successful collaboration with HadSpec.

7. It would be advantageous if JPAC were recognized more widely as a collaboration, e.g., by being listed as such in INSPIRE.

This has happened, furthermore JPAC's logo (designed by A. Jackura) is included wherever JPAC papers or talks are cited, and it has become internationally recognized.

8. During the review, some center members expressed a long-term vision to include Transverse Momentum Distributions (TMDs) in JPAC. This would require significant additional manpower and possibly a dilution of current efforts. We suggest that, in the near term, JPAC focuses on amplitude analyses.

Indeed, given the size of the center and the vast number of topics in spectroscopy that require dedicated work, we concentrated our efforts on amplitude analysis focusing on spectroscopy.

9. The tight collaboration between JPAC members and experimental groups is a crucial aspect of JPAC. In order to minimize cases where issues on the experimental side prevent completion of projects, we suggest close scrutiny by senior JPAC members could help in choosing projects to minimize this risk.

Given differences in how each collaboration operates, we have resolved this issue on a case-by-case basis. For example, when appropriate we have published theory papers independently, on a faster timescale than the experimental publication. We remark that the number of experimental papers co-signed by JPAC members has increased in the last years, showing that the project selection strategy is working.

10. JPAC should consider publishing tutorial materials concerning amplitude analysis. Although this is not the purpose of the group, JPAC members have developed substantial expertise in this rather poorly documented area. Writing tutorial and

educational material would provide a strong benefit to the field and assist in educating future junior members of the group.

We have published papers on amplitude analysis formalism (1712.02815, 1805.02113, 1910.04566) and continue developing tutorials.

11. Raise the visibility of JPAC on the JLab theory site. Currently links to EBAC are more prominent than those to JPAC. Place a link on the research page:
https://www.jlab.org/div_dept/theory/highlight/index.html

The link to the old website is present on the new JLab theory site. We have just released a new website on <https://www.jpac-physics.org>, where we are migrating all the resources from the old site. We will update the link on the JLab theory site soon.

12. If JPAC were to cease, it is not clear how long the knowledge and expertise it has developed would continue to be useable for data analysis. It would be useful to review if the current method of dissemination of information is viable should funding for JPAC end.

Most of the information is publicly available. The results of the last 10 years have been collected in a pedagogical review paper. We try to maintain updated versions of the codes on public repositories. Other pedagogical resources are available.

Recommendations:

We recommend continued funding and support for the joint faculty position between JLAB and IU, for the leadership of the Center in general, and for Adam Szczepaniak in particular. We strongly support the continuation of Adam Szczepaniak as the director of JPAC. In view of the impending departure of Mike Pennington from Jefferson Lab, we recommend that as soon as his replacement is known, Prof. Szczepaniak discuss the status & the future of the JPAC with him/her.

This has happened.

The Lab management and the experimental collaborations work closely with the Center's leadership in preparing future proposals, and supporting them with "what might be lost" scenarios if the center does not get a sustained long-term budget consistent with their mission.

JLab management has been very supportive of the JPAC effort.

As noted above, frustration was expressed by JPAC members about collaborations with experimental groups not leading to timely publications. We recommend JPAC management to look for ways to mitigate this issue. A good starting point might be to contact the CTEQ

collaboration, which has long dealt with these issues, and more formal connections for advice. Further, regular meetings at a monthly or bi-monthly frequency between JPAC and experimental groups should be considered.

This has happened (see response to comment 9).