



Code dissemination: some personal thoughts

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Consider three cases:

1. EasyVVUQ, a toolbox developed as part of an European Commission funded project
 - a. **Open source from the beginning**
2. SOLPS (now SOLPS-ITER)
 - a. **Multiple developers, last big change was from IPP → ITER**
3. ETS
 - a. **Multiple versions, developers, codes**

Dissemination of a code is not just making it open source and throwing it over the fence!

Amongst the aspects that should be addressed

- Code license, code contribution policy
- Documentation
- Tutorials / Examples
- Training (webinars, hackathons)
- Ongoing support (keeping the code running, addressing bugs, providing enhancements)



EasyVVUQ, a toolbox developed as part of an European Commission funded project

- **Python 3 framework to facilitate verification, validation and uncertainty quantification (VVUQ) for a wide variety of simulations**
- Open source from the beginning
- Developed as part of the EU Horizon 2020 project VECMA (under grant agreement No 800925).
- <https://github.com/UCL-CCS/EasyVVUQ>
- <https://easyvvuq.readthedocs.io/>
- Examples / tutorials under “tests” and “tutorials” in the repository
- Some paid-for support under a UK project (SEAVEA) after the VECMA project finished

Issues:

- No entity with resources to pay for ongoing developments or to pay to provide support

SOLPS-ITER



SOLPS (now SOLPS-ITER)

- Multiple developers, last change was from IPP → ITER
- Xavier Bonnin at ITER coordinates ongoing development
 - **Gatekeeper for pull requests**
 - **Significant work on managing multiple branches**
 - **Significant effort in training, addressing users' problems**
 - SLACK
 - JIRA
 - E-mail
 - **Managing new developments (wide grid version of the code)**
- IPP has changed the license on its part of SOLPS-ITER to EUPL
- ITER is planning on a public release of
 - **IMAS**
 - **A number of codes including SOLPS-ITER**
- ITER is continuing to invest significant resources in SOLPS-ITER
 - **ACH-Barcelona is contributing expertise!**



ETS

- Multiple versions
 - **ETS-5 (Kepler, CPO) [ITM/WPCD]**
 - **ETS-6 (Kepler, IDS) [IMAS]**
 - **ETS-7**
 - **ETSpy, python workflow version (IDS AL4, DD3)**
 - **ETS-PAF, persistent actor framework (IDS AL4 and AL5, DD3 with DD4 work started)**
 - **Some support through ACH and some from Chalmers (supporting 1 week code camps)**
- Multiple developers of the workflows
 - **ETS-6 Dmytro Yadykin and others**
 - **ETSpy Rui Coelho and others**
 - **ETS-PAF David Coster and others**
- Workflows use multiple different codes
 - **Mostly shared across the different workflows using FC2K and iWrap**
 - **Some of these codes are directly maintained by the ETS core team, most come from outside**
 - **Limited support to the code owners to maintain and develop their codes, particularly for AL4 → AL5, DD3 → DD4**

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	EasyVVUQ	SOLPS-ITER	ETS
Code license	“LGPL-3.0, GPL-3.0 licenses found”	EUPL for much of it (EIRENE under a Juelich license)	EUPL desired
Code contribution policy	Not found	Comprehensive	Still to be formulated
Documentation	readthedocs	Comprehensive manual	Mixed
Tutorials	Comprehensive		(recorded, but not that much recent)
Examples	Comprehensive	Extensive set of example cases	Some
Training webinars	None recorded	None recorded	Have some
Training hackathons	> 4	Have had some code camps	Have had some code camps 3 training events
Ongoing support: keeping the code running	Some (mostly) unpaid effort	Yes	ACH (future); Chalmers
Ongoing support: addressing bugs	Some (mostly) unpaid effort	Yes	ACH (future); Chalmers
Ongoing support, enhancements	Some (mostly) unpaid effort	Contracted development plus in-house and contributed	ACH (future); Chalmers



Answering Frank's questions

- What types of codes did you disseminate?
 - **Python UQ (EasyVVUQ)**
 - **Edge plasma transport / kinetic neutrals code (SOLPS-ITER)**
 - **Core integrated simulation (ETS)**
- What preparations were needed?
 - **Code cleanup, endless discussions, creation of documentation and examples**
- What licensing model did you use?
 - **GPL, LGPL; EUPL; EUPL (desired)**
- How did you build a user base?
 - **Conference presentations, hackathons; being very good and then selected by ITER; haven't really built a user-base yet**
- What approach did you take to train new users?
 - **Hackathons; code camps, have people visit IPP (past) or ITER (new), training events; have had training events**
- What challenges did you encounter along the way?
 - **Preparation of documentation and examples; finding a good model for providing support (github/gitlab/jira issues; SLACK; ...); getting agreement from all of the ETS developers and the developers of the used codes to agree (ongoing); getting support for the required continuing efforts (adaptation to a moving IMAS, bug fixes, new physics, new output needed for other codes)**



What are the issues?

- Complicated ownership questions
 - **Who were the developers?**
 - **Who can decide to make the code open source?**
- Support for new users of the code
 - **How much of a priority should this be?**
 - **Where will the resources come from?**
- License for the code
 - **Which license should be used? [Endless discussions are possible]**
- What happens when multiple codes come into play?
 - **SOLPS consists of B2, EIRENE, CARRE, DIVGEO, AMDS, TRIANG, ...**
 - **ETS has the core framework (transport solver and some ancillary routines), but other codes are also needed**
 - **Equilibrium, heating and current drive, transport models, sawteeth models, ...**
 - **Would like to open source as many as possible ...**