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## Agreement

on the integration of parts of the Fortran package ZFITTER into the c++ package Gfitter

between

### ZFITTER:

A. Akhundov, D. Bardin, P. Christova, L. Kalinovskaya, S. Riemann, T. Riemann [spokesperson, [tordriemann@gmail.com](mailto:tordriemann@gmail.com)] for 14 ZFITTER authors [per 31. June 2011 also authoring the Standard model library of ZFITTER: A. Arbuzov, M. Awramik, M. Bilenky, M. Czakon, O. Fedorenko (deceased), A. Freitas, M. Gruenewald, A. Olchevsky]  
[see <http://zfitter.com>]

### Gfitter:

J. Haller, A. Hoecker [spokesperson, [Andreas.Hoecker@cern.ch](mailto:Andreas.Hoecker@cern.ch)], K. Moenig for the 9 members of the Gfitter group [per 13. March 2011 also 'responsible' for Gfitter: M. Baak, H. Flaecher, D. Ludwig, M. Schott, J. Stelzer]  
[see <http://cern.ch/Gfitter>]

moderated by H. Dosch [[Helmut.Dosch@desy.de](mailto:Helmut.Dosch@desy.de)]

1.

Gfitter acknowledges and respects the copyright [Urheberrecht] and licence rights of the ZFITTER program as being held by the ZFITTER authors.

ZFITTER acknowledges and respects the copyright [Urheberrecht] and licence rights of the Gfitter program as being held by the Gfitter authors; the copyright [Urheberrecht] and licence rights of the Gfitter/GSM subpackage are regulated by this agreement.

2.

Gfitter expresses the interest to integrate parts of the Fortran package ZFITTER into the C++ package Gfitter in order to make the integrated package Gfitter/GSM available to the physics community as an open source library in a modern language for the era of the LHC and beyond.

3.

ZFITTER and Gfitter agree on the creation of a common, integrated sub-package Gfitter/GSM, to be co-authored by members of both groups and to be made available to the physics community as open source software [with conditions of use; see below]:

The authors are:

A. Akhundov [ZFITTER], A. Arbuzov [ZFITTER], M. Awramik [ZFITTER], M. Czakon [ZFITTER], D. Bardin [ZFITTER], M. Bilenky [ZFITTER], P. Christova [ZFITTER], O. Fedorenko [ZFITTER], A. Freitas [ZFITTER], M. Goebel [Gfitter], M. Gruenewald [ZFITTER], J. Haller [Gfitter], A. Hoecker [Gfitter], L. Kalinovskaya [ZFITTER], K. Moenig [Gfitter], A. Olchevski [ZFITTER], S. Riemann [ZFITTER], T. Riemann [ZFITTER];

The responsibility of ZFITTER group members covers the correctness of the Fortran package ZFITTER v.6.42, and that of the Gfitter group members the programming and correctness of the c++ software Gfitter/GSM.

An Authors file contains the names of 14+4 authors in alphabetical order and the web addresses <http://zfitter.com> and <http://cern.ch/Gfitter>.

The ZFITTER or Gfitter group memberships and responsibilities are indicated, and the affiliations and/or email addresses are given according to the proposals of authors.

The Authors file is attached to the email with this agreement as part of the attached sub-package Gfitter/GSM.

4.

The original sub-package Gfitter/GSM is defined by the software package Gfitter/GSM, delivered by J. Haller to T. Riemann [3 March 2011].

Gfitter states that this is the actual production code for calculations of Standard Model physics. It is used, among others, for the determination of the W and Z boson decay widths.

This version of sub-package Gfitter/GSM [not the full Gfitter package] will be open for distribution on demand and under certain conditions to be defined on a case-by-case basis.

The complete sub-package Gfitter/GSM of 3 March 2011 is documented as a single attachment to the email with this agreement and will not be part of the Gfitter open source package.

5.

The release of the updated sub-package Gfitter/GSM is based on the condition that satisfactory or even excellent numerical agreement of Gfitter with ZFITTER is proven:  
The numerical sample outputs of ZFITTER and Gfitter agree with 5-6 digits (satisfactory) or with 7-8 digits (excellent) for the following predictions:

- the mass of the W boson
- the effective weak mixing angle
- the 8 partial decay widths of the Z boson into neutrinos, electrons, muons, tau leptons, up-quarks, down-quarks, c-quarks, b-quarks;
- the total decay width of the W boson.

The subpackage Gfitter/GSM of the open source Gfitter package agrees up to class names, comment lines and some re-organizations of the header files with the version of 3 March 2011.

It is made and planned to be hold fully functioning within the Gfitter package for the era of the LHC and potentially beyond that.

The ZFITTER version v.6.42 with the specific flag settings used for the comparison [therefore this is a 'tuned comparison'] and the file with the numerical outputs from both packages have been be delivered by the Gfitter authors.

They are not a part of the open source sub-package Gfitter/GSM, but will be retained for the documentation of backward compatibility of Gfitter by both groups and are also open source.

The ZFITTER v. 6.42 and the two numerical outputs are attached to the email with this agreement.

The tuned numerical comparisons are performed by members of both groups and shall be made public for documentation of the backward compatibility of Gfitter by submission to the hep-ph archive and as a DESY Red Report.

The write-up will be coordinated and finally submitted by T. Riemann in cooperation with A. Hoecker.

## 6. Licence and additional conditions of use

6.A.

Licence

The licence agreements for ZFITTER defined by "Computer Physics Communications", see

<http://cpc.cs.qub.ac.uk/summaries/ADMJ> ,

<http://cpc.cs.qub.ac.uk/licence/licence.html> ,

will also apply to the sub-package Gfitter/GSM.

Basically, it is demanded that ... Publications which result from using the acquired program will reference the articles in Computer Physics Communications and in European Physics Journal C which describe the program ... :

- D. Bardin et al., Comput. Phys. Commun. 133 (2001) 229, doi: 10.1016/S0010-4655(00)00152-1 ,  
e-Print: arXiv:hep-ph/9908433v3 [hep-ph] (1 Mar 2000)

- A. Arbuzov et al., Comput. Phys. Commun. 174 (2006) 728, doi: 10.1016/j.cpc.2005.12.009 ,  
e-Print: arXiv:hep-ph/0507146v1 [hep-ph] (12 Jul 2005),

plus

- H. Flacher et al., Eur. Phys. J. C60 (2009) 543; Erratum-ibid. C71 (2011) 1718,  
doi: 10.1140/epjc/s10052-009-0966-6 and doi: 10.1140/epjc/s10052-011-1718-y ,  
e-Print: arXiv:0811.0009v4 [hep-ph] (20 Jul 2011)

and

that ... No user or site will re-distribute the source code or executable code to a third party in original or modified form without the written permission of the author ...

For ZFITTER `the author' is T. Riemann, for Gfitter it is A. Hoecker.

6.B.

Additional conditions of use

ZFITTER allows and encourages since more than 20 years the linking of ZFITTER and the attaching of user interfaces without special permission. It is not foreseen that users modify ZFITTER or integrate it into other software because it represents benchmark calculations, and a proliferation of ZFITTER is not in the interest of the authors or of the physics community.

These conditions of use shall also be applied to the sub-package Gfitter/GSM:

Changes of Gfitter/GSM deserve the written permission by the spokespersons of ZFITTER and Gfitter, while linking and the addition of user interfaces are explicitly allowed.

7.

The licence file contains the contents of statements of paragraph 6.

It is attached to the email with this agreement as part of the attached sub-package Gfitter/GSM.

8.

Summary of the components of the sub-package Gfitter/GSM resulting from this agreement

- Gfitter/GSM sub-package; version definition by date of this agreement
- Licence file
- Authors file

9.

Since 2006, members of the Gfitter group are creating and using software derived from ZFITTER, and since December 2007 there are publications by the Gfitter group, or by members of it, without mentioning this use of ZFITTER and without quoting the 2 above-mentioned CPC articles [for this use].

Gfitter people will issue Errata in the cases where it appears possible and reasonable to them.

Gfitter published, with the explicit agreement of ZFITTER, the article "Updated Status of the Global Electroweak Fit and Constraints on New Physics", M. Baak, M. Goebel, J. Haller, A. Hoecker, D. Ludwig, K. Moenig, M. Schott, J. Stelzer, DESY-11-107, CERN-OPEN-2011-033, Jul 2011, 58 pp, e-Print: arXiv:1107.0975v1 [hep-ph] (5 Jul 2011),

[TO BE ADDED before agreement is considered final: ]

Eur. Phys. J. Cxxxx (2011) yyy = doi: zzz.

The publication procedure is part of the present negotiations. The scientific contents of the article may not be changed afterwards. Addenda or Errata have to be arranged in cooperation with T. Riemann for ZFITTER.

10.

The 14 of the ZFITTER authors and the 9 members of the Gfitter group took carefully notice of the contents of this agreement.

T. Riemann for 14 of the ZFITTER authors and A. Hoecker for the 9 members of the Gfitter group declare that they have a valid procuration from all their group members to validate this agreement.

The validation of the agreement is performed by email exchanges of the 2 spokespersons, including into the lists of email recipients the 14 of the ZFITTER authors and the 9 members of the Gfitter group mentioned above, under the moderation by H. Dosch, with the necessary attachments of documents.

At the moment of negotiation, the complete Gfitter package is handed out to ZFITTER for tests.

When these tests produce the sample output obtained in the tuned numerical comparisons

[preliminary: the sample output NumComparisonGfitterZFITTER.png dated 5. Sep 2011], Gfitter may make again proper use of the Gfitter/GSM software.

The tuned numerical comparisons have to be successfully finished and published at hep-ph and submitted as Red Report of DESY until 8 December 2011 (see paragraph 5).

At that moment Gfitter, including GSM, will be made open source.

If a component of this procedure [comparison, submissions, open source status] fails, the agreement is considered not to be valid.

11.

We begin with a German phrasing due to the importance of the agreement in Germany:

"Beide Gruppen betrachten nach Erfuellung dieses Agreements den Urheberrechte/Copyright/Lizenz-Streit bezueglich der ZFITTER software als vollstaendig geheilt."

The German phrasing is prior to the following English translation:

"Both sides consider the legal dispute related to the rights of ZFITTER to be completely cured by this agreement."

Both groups express their interest to control and, in case, to demand the fulfilment of this agreement also in future.

15 Sep 2011

ZFITTER and Gfitter

End of agreement

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