

# Interactive Open Access Publishing and Collaborative Peer Review for Improved Scientific Communication and Quality Assurance

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## Introduction

- *challenges of scientific quality assurance & perspectives of Open Access*

## Interactive Open Access Publishing & Collaborative Peer Review

- *concepts & effects*

## Atmospheric Chemistry and Physics (ACP) & European Geosciences Union (EGU)

- *aims & achievements*

## Outlook

- *vision & propositions*

## ***Scientific, educational & economic advantages of free online availability of scientific research publications***

### **Educational:**

- *inform & stimulate students & general public*
- *equal opportunities in the information society (global & social)*

### **Economic:**

- *liberate distorted scientific information market*  
*(subscription/usage, cost/benefit, library budget crisis)*
- *enhance efficiency & facilitate innovation*  
*(formatting, distribution, evaluation, archiving, etc.)*

### **Scientific:**

- *enhance research impact & productivity*
- ***improve quality assurance:*** *bigger need, larger gain and higher importance than “mere increase of impact & productivity”*

***Open Access not a threat to scientific quality assurance  
but an urgently needed opportunity for improvement***

### **Traditional Peer Review: fully compatible with OA**

- *successful OA journals with traditional peer review, e.g.:*  
*NJ Physics, NP Geophys., PLoS Biology, BMC Structural Biology, etc.*

### **Information for Reviewers: strongly enhanced by OA**

- *unlimited & interdisciplinary access to relevant publications*
- *subscription: limited access to relevant publications*

### **Collaborative Peer Review: fully enabled by OA**

- *unlimited & interdisciplinary discussion in & between scientific communities*
- *subscription: limited circle of readers & comment*
- *ACP/EGU, economics e-journal, PLoS One, BMC Biology Direct, etc.*

***Large proportion of scientific publications  
careless & faulty***

**Tip of the Iceberg: fraud**

- *selective omission, tuning & fabrication of results*
- *e.g. Schön et al., 2002/2003; Hwang et al. 2004/2005*

**Common Practice: carelessness**

- *superficial & irreproducible description of experiments & models*
- *non-traceable arguments & conclusions, duplicate & split papers, etc.*
- ***dilute rather than generate knowledge***

**Consequences: waste & misallocation of resources**

- *costly reconstruction of poorly described methods & results*
- *propagation of errors & misinterpretations*
- *misevaluation of projects & scientists*

***Traditional peer review insufficient  
for efficient quality assurance in today's  
highly diverse & rapidly evolving world of science***

**Editors & Referees: limited capacities & competence**

- *few editors for large subject areas*
  - ⇒ *limited knowledge of scientific details & specialist referees*
- *work overload, conflicts of interest & little reward for referees*
  - ⇒ *superficial or prejudiced review & evaluation*

**Closed Peer Review: retardation & loss of information**

- *publication delays, watering down of messages, plagiarism*
- *critical, supportive & complementary comments unpublished*

**Traditional Discussion: sparse & late commentaries**

- *labor-intensive, delayed & watered-down by peer review*  
*(comment/article ratio 1978 ⇒ 1998: 1/20 ⇒ 1/100)*

***Conflicting needs of scientific publishing:  
rapid publication vs. thorough review & discussion***

**Rapid Publication: widely pursued**

- *required for efficient exchange of new findings & open questions*
- *traditionally achieved by rapid reviews & short papers with a lack of detailed information*

**Thorough Review & Discussion: mostly neglected**

- *required to identify scientific flaws & duplications*
- *traditionally limited by availability of referees, review time & access to information*

***Two-stage open access publication with  
collaborative peer review***

**Stage 1: Rapid publication of Discussion Paper**

*pre-selected by editors (optionally supported by referees),  
fully citable & permanently archived (more than traditional preprint)*

**Public Peer Review & Interactive Discussion**

*referee comments & additional comments by interested colleagues  
published alongside discussion paper (anonymous or by name,  
non-reviewed but individually citable & permanently archived)*

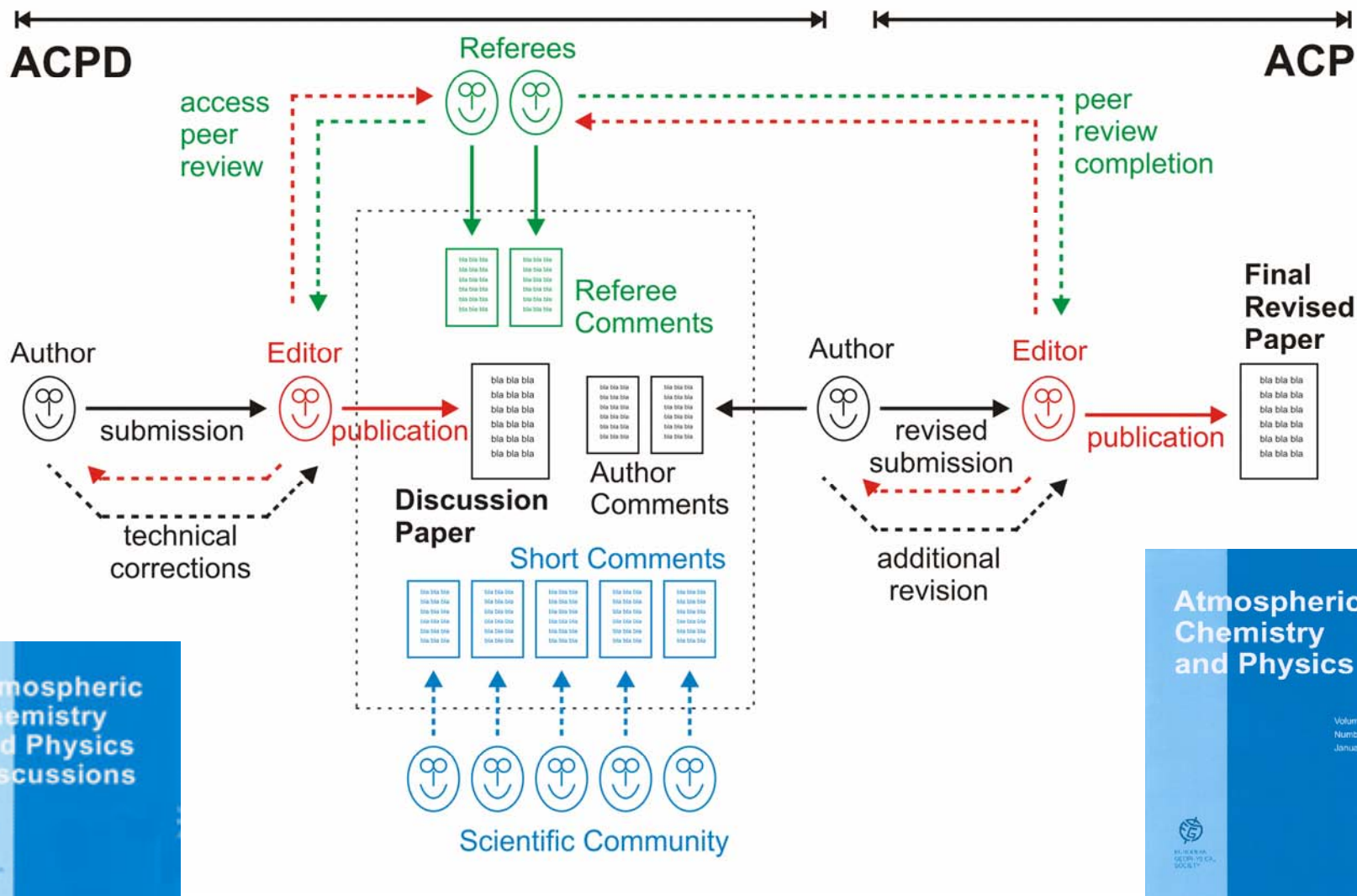


**Stage 2: Review completion & publication of Final Paper**

*analogous to traditional peer review & journal publication*



## Discussion Forum (Pub. Stage 1) + Journal (Pub. Stage 2)



***All-win situation for authors, referees & readers***

## Discussion Paper

- ***free speech*** & rapid publication (*authors & readers*)

## Public Peer Review & Interactive Discussion (Collaborative Peer Review)

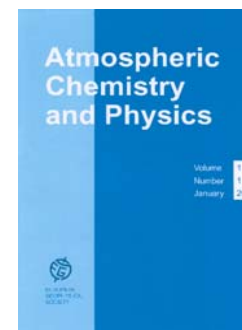
- *direct feedback & public recognition for high quality papers* (*authors*)
- *prevention of hidden obstruction & plagiarism* (*authors*)
- *documentation of critical comments, controversial arguments, scientific flaws & complementary information* (*referees & readers*)
- *deterrence of careless, useless & false papers;*  
***save refereeing capacities*** & readers' time (*referees & readers*)

## Final Paper

- ***maximum quality assurance & information density***  
*through complete peer review, public discussion & final revision* (*readers*)

## Publisher

- *European Geosciences Union (EGU) & Copernicus (Max Planck Society Spin-Off)*
- *free internet access ([www.atmos-chem-phys.org](http://www.atmos-chem-phys.org))*  
*paper copies & CDs on demand*
- *copyright: Creative Commons License*



## Editors

- *globally distributed network of ~ 70 co-editors (covering 32 subject areas)*
- *coordination by executive committee & chief executive editor*
- *advisory board chaired by Nobel laureate P. J. Crutzen*

## Publication Market

- *~ 40 traditional journals publishing ~ 4000 atmospheric science papers/yr*
- *major journals (2006):*
  - J. Geophys. Res. (AGU) ~ 1000 papers/yr*
  - Atmos. Environ. (Elsevier) ~ 700 papers/yr*
  - Atmos. Chem. Phys. (EGU) ~ 400 papers/yr (~10%)*
  - J. Atmos. Sci. (AMS) ~ 200 papers/yr*
  - J. Atmos. Chem. (Springer) ~ 100 papers/yr*

## Discussion Papers (ACPD)

- **submissions** (increasing): ~ 40 month<sup>-1</sup> ( $D \approx US > UK > F \dots$ )
- **rejections** (access review): ~ 10 %
- **submission-to-publication time**: ~ 1 month (min: 10 days)
- **publication charge** (author): ~ 1000 EUR/paper (incl. final paper)

## Final Papers (ACP)

- **rejections** (review completion): ~ 10 % (~ 20 % total, save referees)
- **submission-to-publication time**: ~ 1 month (3-6 months in total)

## Interactive Discussion

- **interactive comments / discussion paper**: ~ 5 (up to 20)
- **comment pages / paper pages**: ~ 50 %
- **referee anonymity** (exp. vs. mod.): ~ 60 % (70% vs. 30%)
- **reader comments / discussion paper**: ~ 1/4 (up to 5)
- **constructive suggestions, harsh criticism, applause**

## Extended Discussion

- **peer-reviewed commentaries / paper**: ~ 1/100 ( $\approx$  trad. journals)

## Discussion Paper

**Publication Date**     **Title, Authors, Reference**

**Online Access**



20.08.2004     **A review of the Match technique as applied to AASE-2/EASOE and SOLVE/THESEO 2000**  
 G. A. Morris, B. R. Bojkov, L. R. Lait, M. R. Schoeberl  
*Atmospheric Chemistry and Physics Discussions*, 4, 4665-4717, 2004  
 SRef-ID: 1680-7375/acpd/2004-4-4665

[Abstract](#)  
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## Interactive Discussion

**Status:** Final Response (Author Comments only)



RC S1626 : 'General comments from reviewer' , Anonymous Referee #3, 27.08.2004, 17:21  

AC S3996 : 'Response to Reviewer #3' , Gary Morris, 17.05.2005, 0:23  



RC S1660 : 'Technical issues with the Figures' , Anonymous Referee #2, 31.08.2004, 18:14  

AC S1793 : 'correcting figures' , Gary Morris, 15.09.2004, 6:07  

RC S1971 : ' Match analysis of the winters 1991/1992' , Anonymous Referee #2, 05.10.2004, 9:30  

AC S4010 : 'Response to Referee #2' , Gary Morris, 17.05.2005, 0:49  

RC S1731 : 'Trajectory mapping approach' , Anonymous Referee #2, 07.09.2004, 9:40  

AC S4002 : 'Response to second Referee #2' , Gary Morris, 17.05.2005, 0:28  



SC S1734 : 'Ozone loss from ozone-tracer correlation' , Simone Tilmes, 07.09.2004, 11:36  

AC S4007 : 'Response to S. Tilmes' , Gary Morris, 17.05.2005, 0:30  

RC S2014 : 'Review' . slimane BEKKI. 07.10.2004. 14:48  

AC S4036 : 'Response to Bekki' , Gary Morris, 17.05.2005, 1:09   

SC S2118 : 'Comment #1' , Markus Rex, 19.10.2004, 11:37  

AC S4025 : 'Response to M. Rex' , Gary Morris, 17.05.2005, 0:54  

SC S2126 : 'Comment # 2' , Markus Rex, 19.10.2004, 11:37  

AC S4032 : 'Response to M. Rex - Detailed comments' , Gary Morris, 17.05.2005, 0:56 

**AC:** Author Comment (on behalf of all co-authors)

**RC:** Referee Comment (anonymous or attributed)

**SC:** Short Comment (attributed)

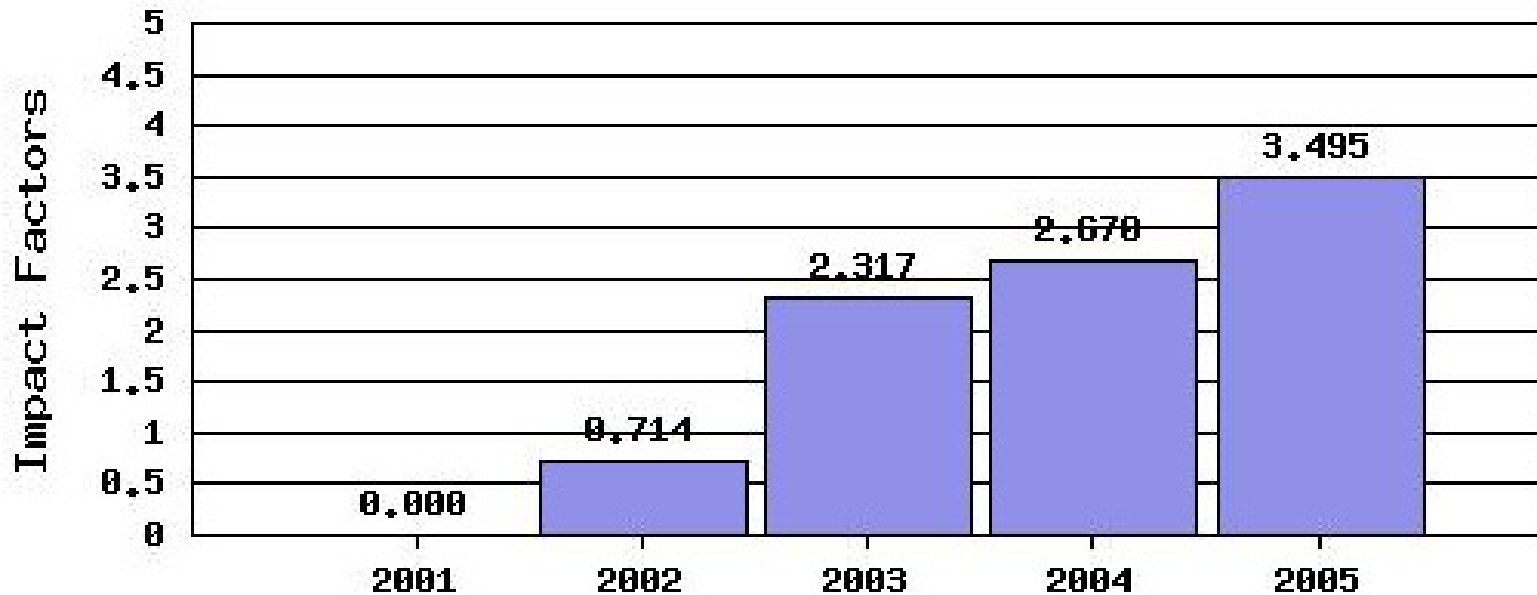
**EC:** Editor Comment (attributed)

 Online Version (PDF)

 Print Version (PDF)



## ATMOSPHERIC CHEMISTRY AND PHYSICS

**ISI Journal Citation Report 2005** (4 years after journal launch)

- **ACP impact factor 3.5** (citations in 2005 to papers of 2003 & 2004)
- # 1** out of 47 journals in “**Atmosphere Sciences**” (incl. Meteo & Climate)
- # 4** out of 129 journals in “**Geosciences**” (Multidisciplinary)
- # 6** out of 140 journals in “**Environmental Sciences**”

## European Geosciences Union (EGU), [www.egu.eu](http://www.egu.eu)

- **Mission & History:** *international society for Earth, planetary & space sciences, merger of EGS & EUG, partner of AGU*
- **Meetings:** *up to 10000 participants, turnover ~ 3 MEUR/yr*
- **Publications:** *global open access leader in geosciences (since 2001), volume ~ 15000 pages/yr, turnover ~ 1.5 MEUR/yr*
- **6 Interactive OA Journals:** *Atmospheric Chemistry & Physics (ACP), Biogeosciences (BG), Climate of the Past (CP), e-Earth (eE), Hydrology (HESS), Ocean Science (OS); ... more to come*
- **3 OA Journals** w. traditional peer review: *Annales Geophysicae (ANGEO), Natural Hazards (NHESS), Nonlinear Processes (NPG)*

## Copernicus Group, [www.copernicus.org](http://www.copernicus.org)

- **Mission & History:** *scientific service provider for EGU & other societies, SME spin-off of the Max Planck Society*
- **Meetings & Publications:** *development & application of advanced software tools for high quality at low cost (~ 100 EUR/page, ~1000 EUR/paper)*



***Promotion of scientific & societal progress by  
open access & collaborative review  
in global information commons***

### **Access to high quality scientific publications**

*review & revision with input from referees & scientific community*

⇒ ***more & better information for scientists & society***

### **Documentation of scientific discussion**

*free speech & public exchange of arguments*

⇒ ***evidence of controversial opinions & open questions***

### **Demonstration of transparency & rationalism**

*transparent & rational approach to complex questions & problems*

⇒ ***role model for political decision process***



## Promote open access publishing

- **prescribe open access** to publicly funded research results
- **transfer funds** from subscription to open access publications:  
*convert subscription budgets (e.g., 30 % per year) into OA publishing funds (e.g., 2000 EUR per year & scientist, plus project-specific funds)*

## Emphasize quality assurance & interactivity

- **foster open access publishing & collaborative peer review:**  
*implement discussion forums in new & existing journals*
- **mere access is not enough** (repositories & self-archiving)

## Improve scientific evaluation & rating methods

- **evaluate individual papers** not just journal impact factors
- **refine statistical parameters** for citation, download, and usage;  
*interactive commenting & rating*