

# Do altmetrics promote Open Access?

An exploratory analysis on altmetric differences between types of access in the field of Physics



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## Do altmetrics promote Open Access?

An exploratory analysis on altmetric differences  
between types of access in the field of Physics

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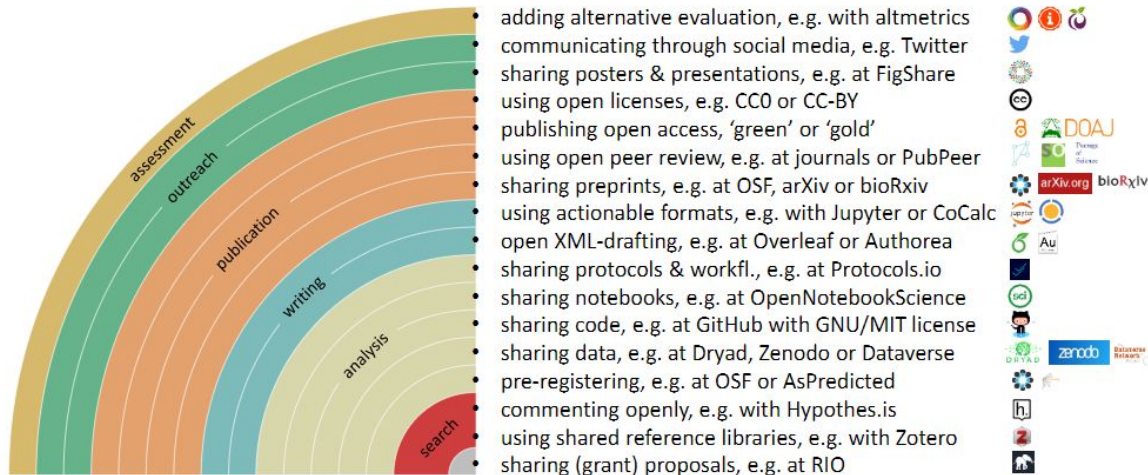
**Do altmetrics promote Open Access?**

**1. Introduction & objectives**

# Introduction

The promotion of Open Science needs new metrics that encourage openness in scientific practices, and can help institutions to monitor them

You can make your workflow more open by ...



# Introduction

Open science and altmetrics both heavily rely on (open) web-based platforms, encouraging users to contribute (via likes, shares, comments etc.). **Altmetrics**, then, are both **drivers and outcomes of open science practices**. More specifically, altmetrics can stimulate the adoption of open science principles, i.e., collaboration, sharing, networking.



## **Next-generation metrics: Responsible metrics and evaluation for open science**

Report of the European Commission Expert Group on Altmetrics

## To what extent this is true?

- Open vs. free
- Drivers | Outcomes

# Objectives

1. **Do altmetric indicators reinforce Open Access** practices regardless of the type of OA?
2. **Are there differences in altmetric scores by type of access?** Green OA publications, Gold OA publications and non OA publications

Preliminary analysis based on two Physics journals (Physical Review B y Physical Review X)

**Do altmetrics promote Open Access?**

## **2. Material & Methods**

## Material & Methods

### Characterics of the journals analized

CLASSIC JOURNAL	OA JOURNAL
Physical Review B (PRB)	Physical Review X (PRX)
Launched in 1970	Launched in 2011
Historical journal in the field of condensed matter physics	Covering all areas of physics
Non-OA journal	Full OA journal



## Material & Methods




We retrieved all documents published in these journals since 2011 in **Web of Science** (40,044 documents)

**Open Access** as defined in Web of Science (initial approach with Altmetric.com and ArXiv failed)

We retrieved altmetric indicators associated to these documents using the DOI and **Altmetric.com** database (14,338 documents with altmetric indicators)





## Material & Methods

**Distribution of documents by type of access and coverage in Altmetric.com **

	<b>Total</b>	<b>Altmetric.com</b>	
 <b>Gold</b>	1,326	1,164	87.8%
 <b>Green</b>	4,464	2,001	44.8%
 <b>Non-OA</b>	34,254	11,173	32.6%
<b>Total</b>	<b>40,044</b>	<b>14,338</b>	<b>35.8%</b>

# Material & Methods

We descriptively analyzed the altmetric indicators to explore if there were significant differences on the number of mentions received by each group of documents:

- **Twitter mentions** 
  - *Public tweets, quoted tweets and retweets only, no favourites*
- **News media** 
  - *Over 2,700 English and non-English global news outlets*
- **Blog mentions** 
  - *Over 11,000 academic and non-academic blogs*
- **Altmetric Attention Score (AAS)** 
  - *The score is derived from an automated algorithm, and represents a weighted count.*
  - *AAS has many limitations (Gumpenberger, Glänzel, & Gorraiz, 2016)*

# Material & Methods

## Documents indexed by PRB and PRX since 2011 in Web of Science

	2011	2012	2013	2014	2015	2016	2017	2018	Total
<b>Physical Review B</b>	6,308	5,818	4,922	4,937	4,998	5,487	5,503	974	38,947
<i>Gold</i>	12	14	20	41	41	44	46	11	229
<i>Green accepted</i>	1	3	1		5	14	9		33
<i>Green published</i>	671	649	626	621	681	663	493	27	4,431
<i>Other</i>	5,624	5,152	4,275	4,275	4,271	4,766	4,955	936	34,254
<b>Physical Review X</b>	43	80	97	226	177	204	230	40	1,097
<i>Gold</i>	43	80	97	226	177	204	230	40	1,097
<b>Total</b>	6,351	5,898	5,019	5,163	5,175	5,691	5,733	1,014	40,044

# Material & Methods

	Total added	% documents with at least 1 mention
<b>Total mentions</b> <i>(including Mendeley)</i>	1,439,521	99%
<b>Total mentions</b> <i>(without including Mendeley)</i>	421,786	93%
→ <i>No. of Mendeley readers</i>	1,017,735	91%
→ <i>No. of tweets</i>	346,378	13%
<i>No. of news stories</i>	28,427	10%
→ <i>No. of Facebook posts</i>	27,708	21%
<i>No. of blog posts</i>	7,908	7%
<i>No. of Google+ posts</i>	5,549	4%
<i>No. of Wikipedia pages</i>	1,944	2%
<i>No. of Reddit posts</i>	1,108	1%

Torres-Salinas, et al. (2018).

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## **3. Results**

# Results

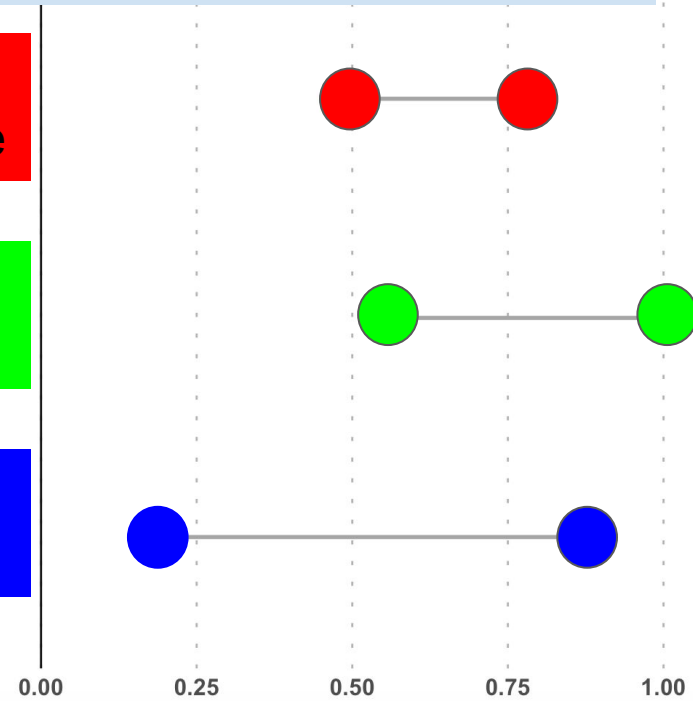
Large differences in median values between three groups of documents:

- Gold OA
- Green OA
- Non-OA

Altmetric  
Attention Score

News and  
blogs mentions

Twitter

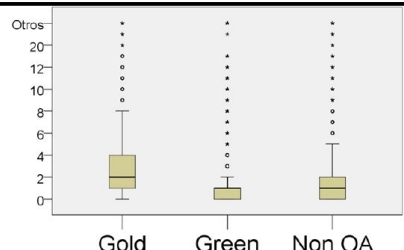
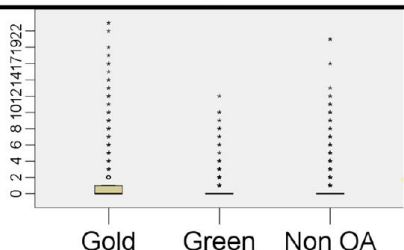
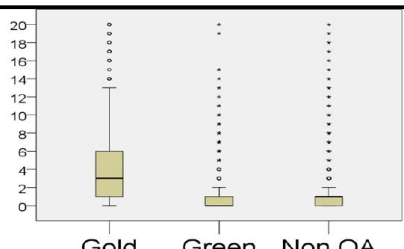


Wilcoxon signed-rank test

# Results

Descriptive indicators for the altmetric indicators of our set of documents disaggregated by type of access.

**Gold OA documents tend to receive a larger number of mentions than green and non-OA documents do.**

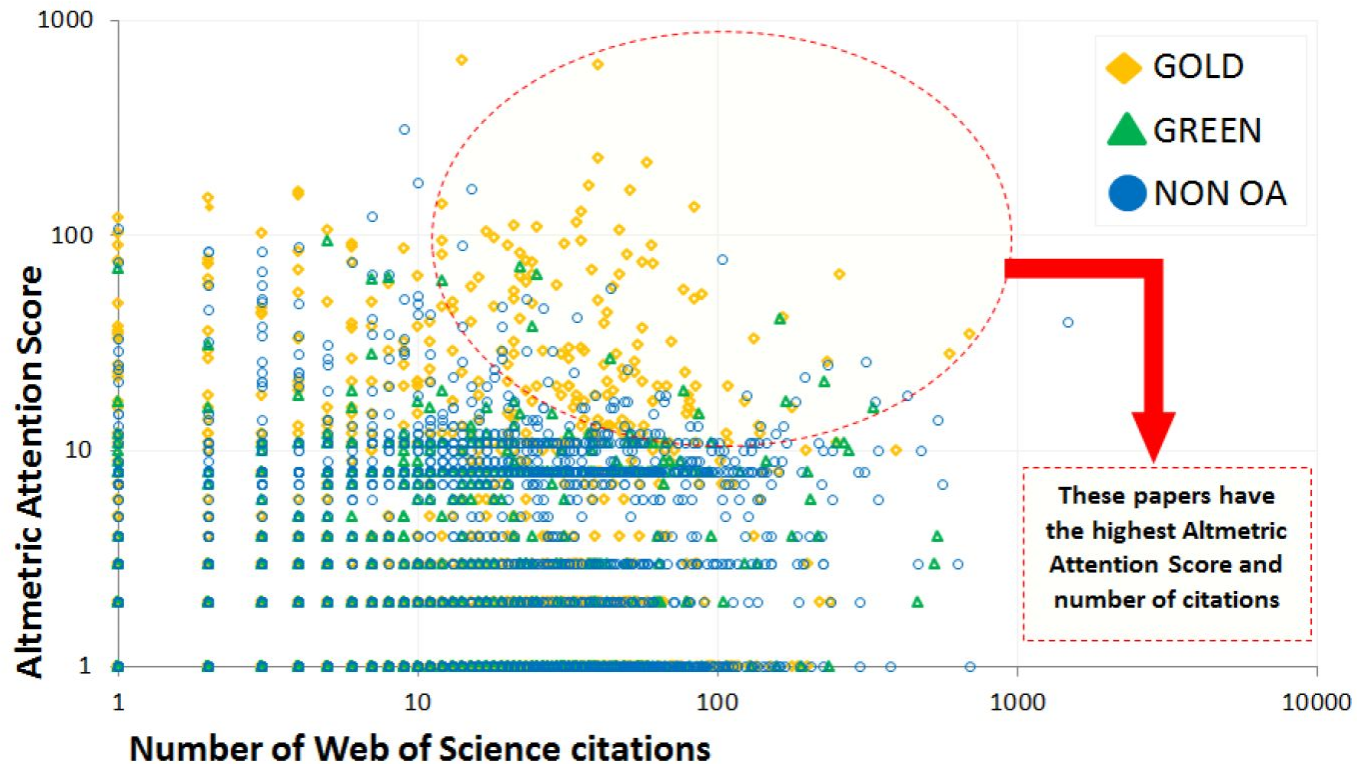
AAS	GOLD	GREEN	NON OA
	<b>Mean</b> 12.11	2.16	2.29
	<b>Median</b> 2	1	1
	<b>Std. Dev.</b> 35.00	5.66	6.16
	<b>Max.</b> 648	95	312
News and blogs mentions	GOLD	GREEN	NON OA
	<b>Mean</b> 1.13	0.23	0.22
	<b>Median</b> 0	0	0
	<b>Std. Dev.</b> 3.77	0.84	0.90
	<b>Max.</b> 57	12	40
Twitter	GOLD	GREEN	NON OA
	<b>Mean</b> 6.95	1.07	1.27
	<b>Median</b> 3	0	1
	<b>Std. Dev.</b> 16.45	3.00	2.96
	<b>Max.</b> 281	22	140



# Results

There is no clear relation between citations and the Altmetric Attention Score

Gold Open Access documents receive higher AAS scores



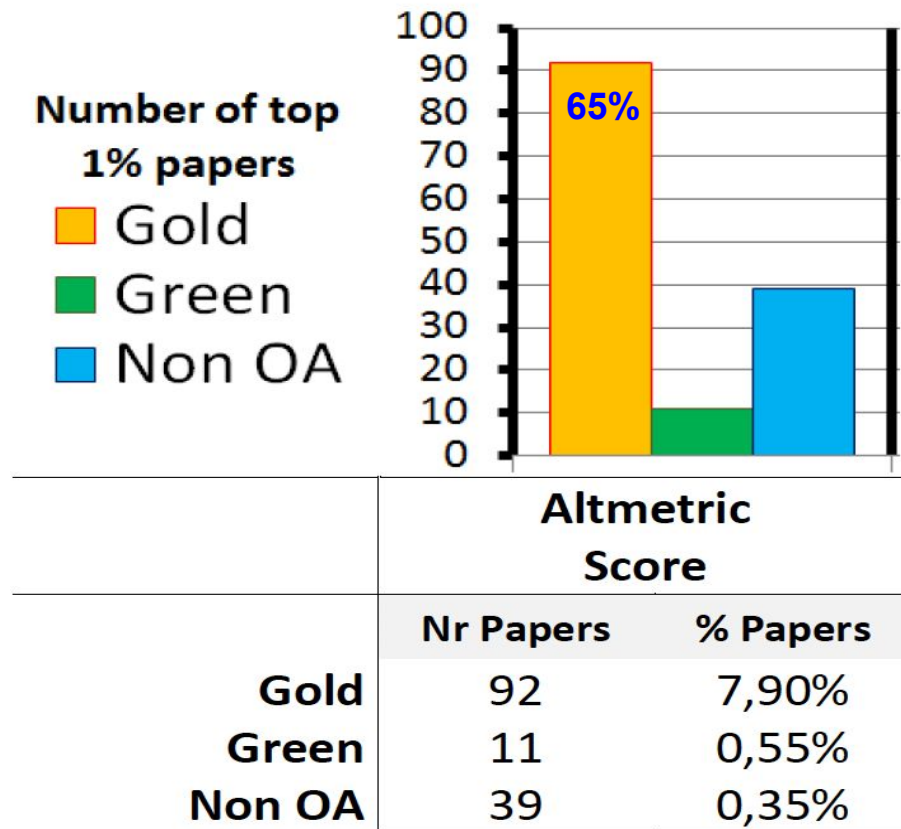
# Results

## Top 1% altmetric Attention Score papers

8% Gold OA pubs are within  
Top 1%

65% of mentions go to Gold OA  
papers

Only 8% of altmetric mentions  
go to green OA publications



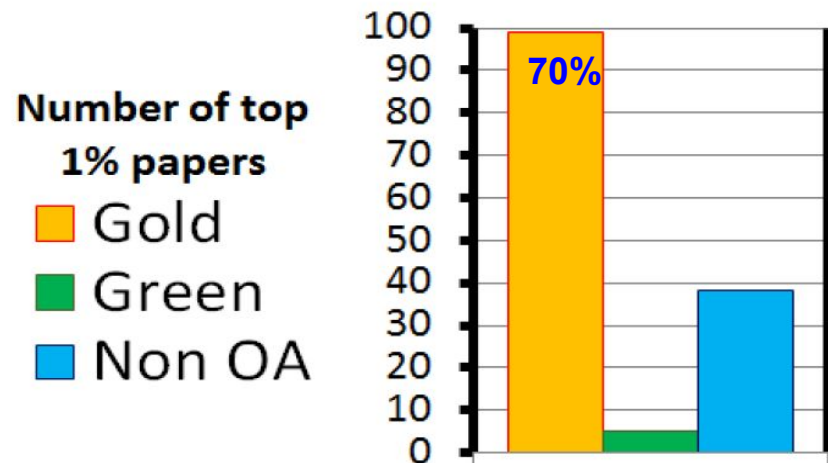
# Results

## Top 1% based on number on tweet mentions

70% are Gold OA

3% are Green

27% are Non OA



	Twitter	
	Nr Papers	% Papers
Gold	99	8,51%
Green	5	0,25%
Non OA	38	0,34%

# Results

**Top 1% based on number on news and blog mentions**

59% are Gold OA

9% are Green

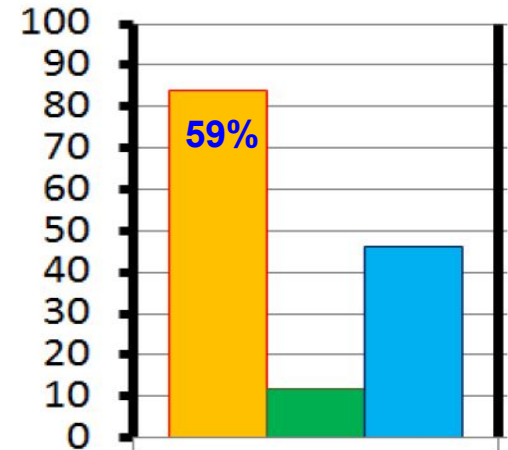
32% are Non OA

Number of top 1% papers

Gold

Green

Non OA



**News and blogs mentions**

**Nr Papers**

**% Papers**

**Gold**

84

7,22%

**Green**

12

0,60%

**Non OA**

46

0,41%

**Do altmetrics promote Open Access?**

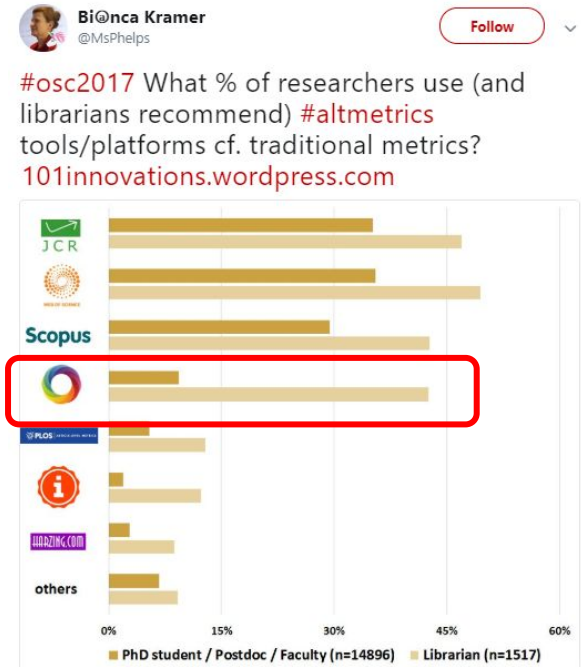
## **4. Discussion**

# Limitations

- Physics is a ‘special’ field, still need to look if results are applicable and consistent in other fields
- Excluding definition of OA in Web of Science
- Green OA publications probably are underrepresented (false negatives)
- Only published Green OA is considered ← [Aguillo \(2018\)](#)

# Discussions

- Additional factors affecting altmetric mentions:
  - Type of publisher
  - Type of journal
  - Field and/or country
  - Commercial interests?



## Discussions

- Findings cannot be generalized but point out at some distinct patterns on type of access for altmetric'd publications.
- OA publications in overall seem to capture more mentions than non-OA publications → **Altmetrics as drivers and outcomes of OS practices**

**BUT...**



# Discussions

## Gold OA publications are:

Best covered in Altmetric.com

Receive higher mentions than documents with other types of access



**Which are the implications for the effectiveness of institutional policies promoting green OA through the creation of repositories and OA infrastructure?**

## Future steps



- Implementation of a large-scale study
- Inclusion of other types of access (Unpaywall)
- Analysis by scientific fields
- Identification of additional factors affecting altmetric figures (e.g., publisher marketing, language, institution)

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# Thanks for your attention

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Do altmetrics promote Open Access? An exploratory analysis on altmetric differences between types of access in the field of Physics<sup>1</sup>

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**Introduction**

The promotion of Open Science needs new metrics that encourage openness in scientific practices and may help researchers to increase their visibility (Vidal et al., 2017). These metrics should allow the promotion of OA, be fair for both OA and non-open access, promote the visibility of research integrity and reproducibility (Lorenzi, 2016). Furthermore, they should cover the complete research cycle from data collection to public dissemination (Storrier, 2016).

In this paper, in 2017, the European Commission (EC) created an Expert Group with the task of addressing the challenges on the availability of scientific literature, solutions as potential metrics that could drive and promote open science alternatives (Lorenzi et al., 2017). Since their inception in 2016, altmetrics have raised great interest. Originally conceived as a variety of metrics, "open to exploring space in the three related dimensions" (Blanton, Tardiff, Gorch, & Stryker, 2016), it was soon suggested that they could be capturing "broad forms of impact" (Lorenzi, Storrier, 2016).

These propositions have been questioned in several occasions (Balcells-Corral, Corral, Iain, Mahon, & Siles, 2017; Torralba, Vidal, Luciano, & Storrier, 2017). Moreover, regardless of the second-stage metrics, altmetric indicators result from ongoing changes in the scientific communication and production system, and as such, it is worth considering their capacity to capture their changes. In this sense, research practices are being supported by a deeper understanding on what altmetrics appear to be measuring (Corral, Van Hout, Zahedi, & Chen, 2016; Balcells-Corral, Arroyo-Muchel, & Corral, 2016; Balcells-Corral, Van Hout, & Balcells-Corral, 2016; Van der Stoep & Shalaby, 2017).

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