



International topic distribution in the HCQ controversy on Twitter

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Data

- 35M French tweets
768k Users
Topics: **COVID & HCQ**
Extracted countries from user information (380k users)
Time frame:

Search Question

How international is the controversy on HCQ?

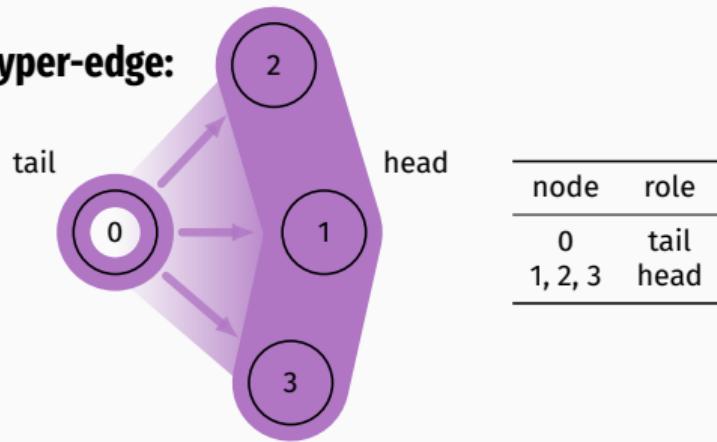
ected using keyword search and stream APIs

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Dynamics on hypergraphs

Hyper-edge:



Hypergraph: $\{N, E\}$: nodes and hyperedges

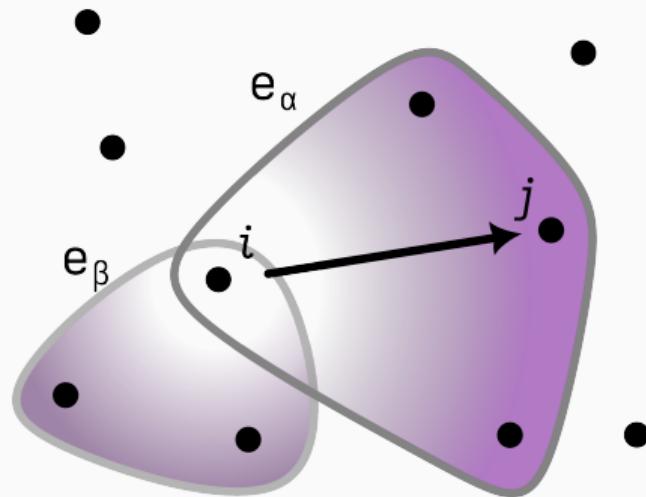
Nodes: same as before

Hyperedges: $e_\alpha = \{\text{tail}, \text{head}\} \in E$

Random walker on a hypergraph

The walker

- sits on a node i
- chooses a hyperedge e_α incident on i in its tail (user i tweeted α) with probability dependant on the hyperedge size (with parameter τ);
- chooses an exit node j from the head of e_α (α get retweeted by user j) with flat probability.



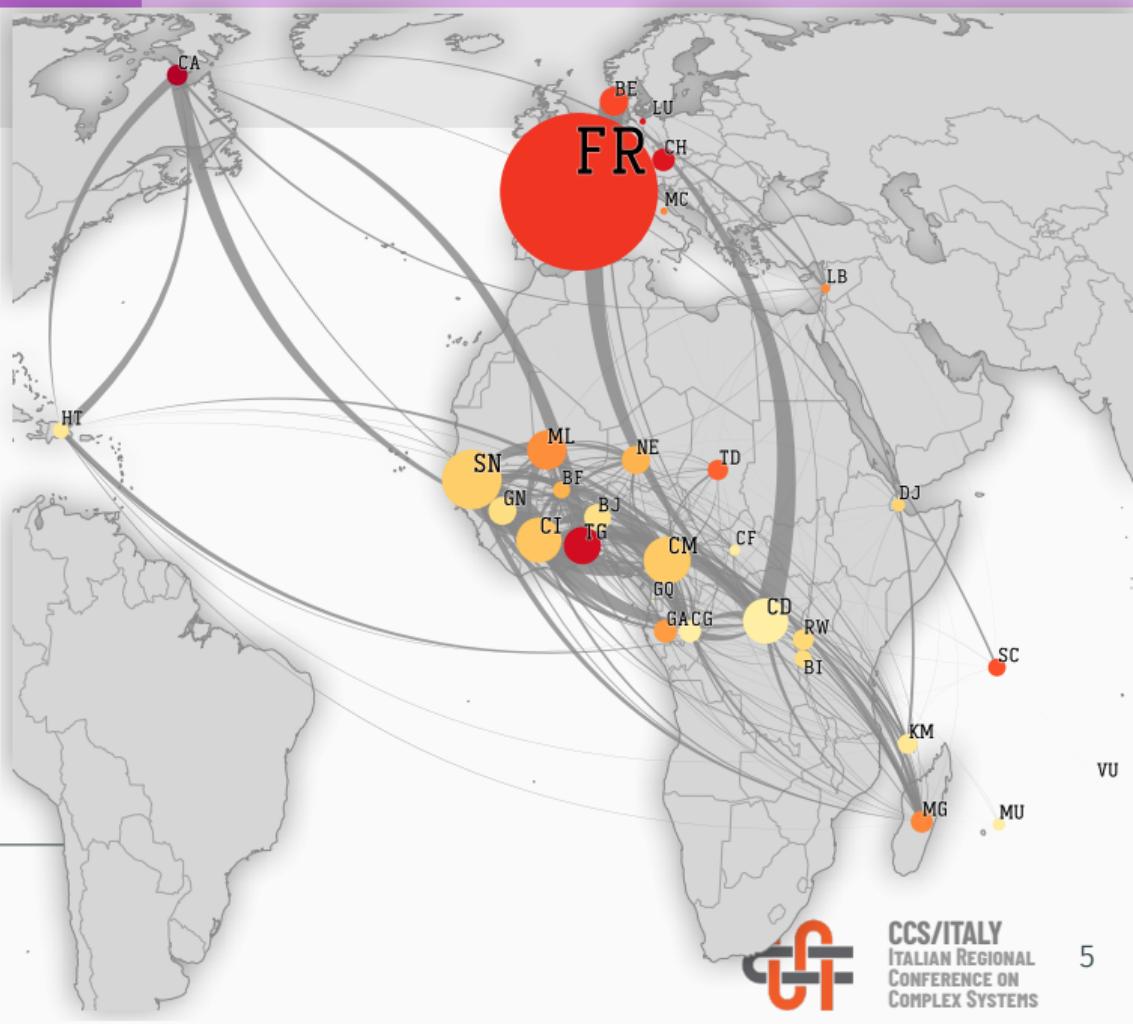
International flow

Transfer probability
between countries in the
hypergraph model.

Relative strength of the HCQ
component: *where we speak
about HCQ?*

Only links with more than expected strength.

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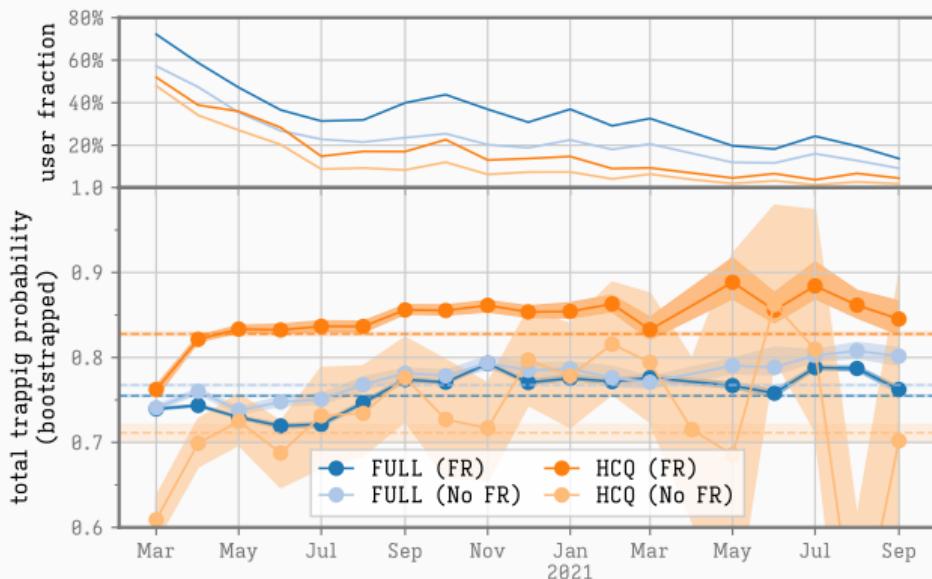
Trapping probability

Probability that a tweets get retweeted within the **same country** in different scenarios.

HCQ trapping probability

HCQ have a higher trapping probability when including tweets from France.

HCQ controversy mostly happening in France.



Topic dynamics.

Non-negative Tensor factorization

Dataset: **COVID** \cup **HQ**.

Tensor: **hashtag co-occurrence**
disaggregated by **time** or **space**.

Approximate to **R** components:

$$t_{ijk} \approx \sum_{r=1}^R a_{ir} b_{jr} c_{kr}$$

$a_{ir} \rightarrow N_H \times R$ hashtag

$b_{jr} \rightarrow N_H \times R$ hashtag

$c_{kr} \rightarrow N_D \times R$ time or space

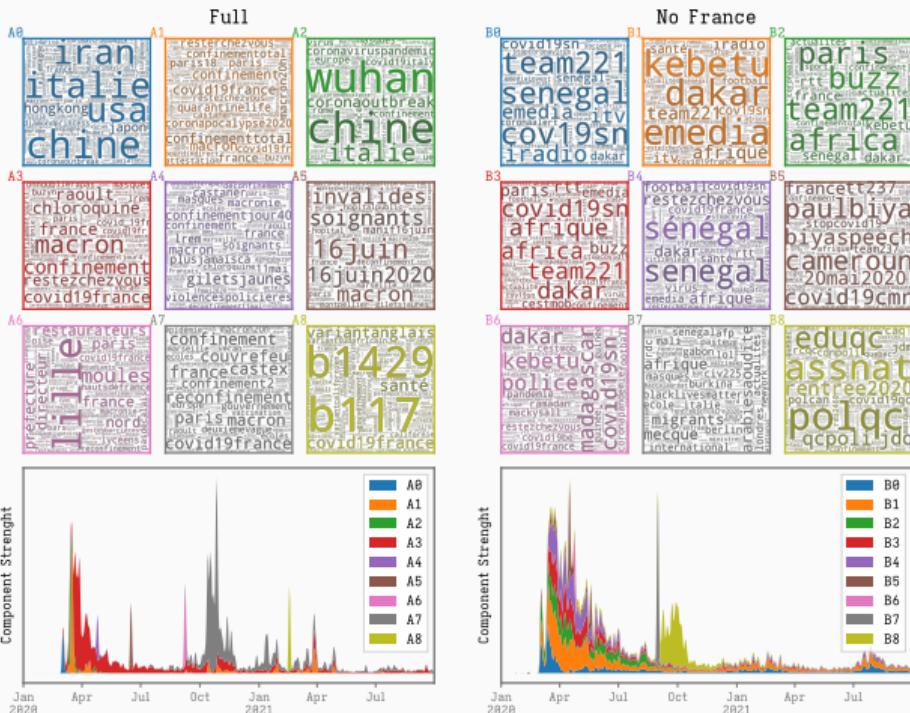
A set of non-negative matrices that account for the strength of association to a component.

Temporal decomposition

The three dimensions are
hashtag, hashtag and time.

A3 the only HCQ related
topic/component

No France no HCQ related
topic/components (many
component related to local
events)

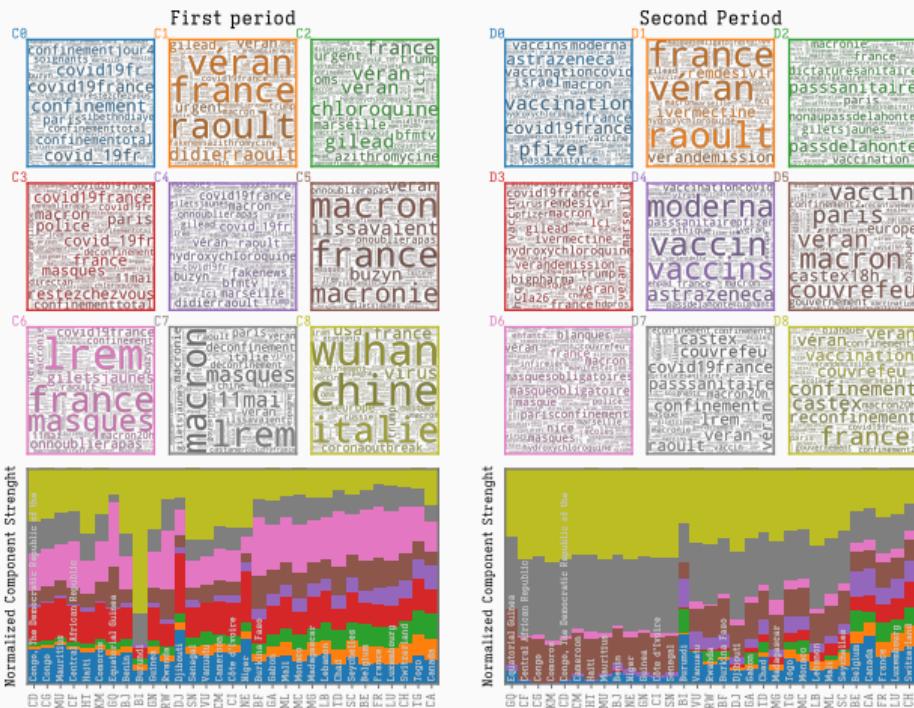


Space decomposition

The three dimensions are
hashtag, **hashtag** and **country**.

C2 C4 D1 D3 HCQ related
components

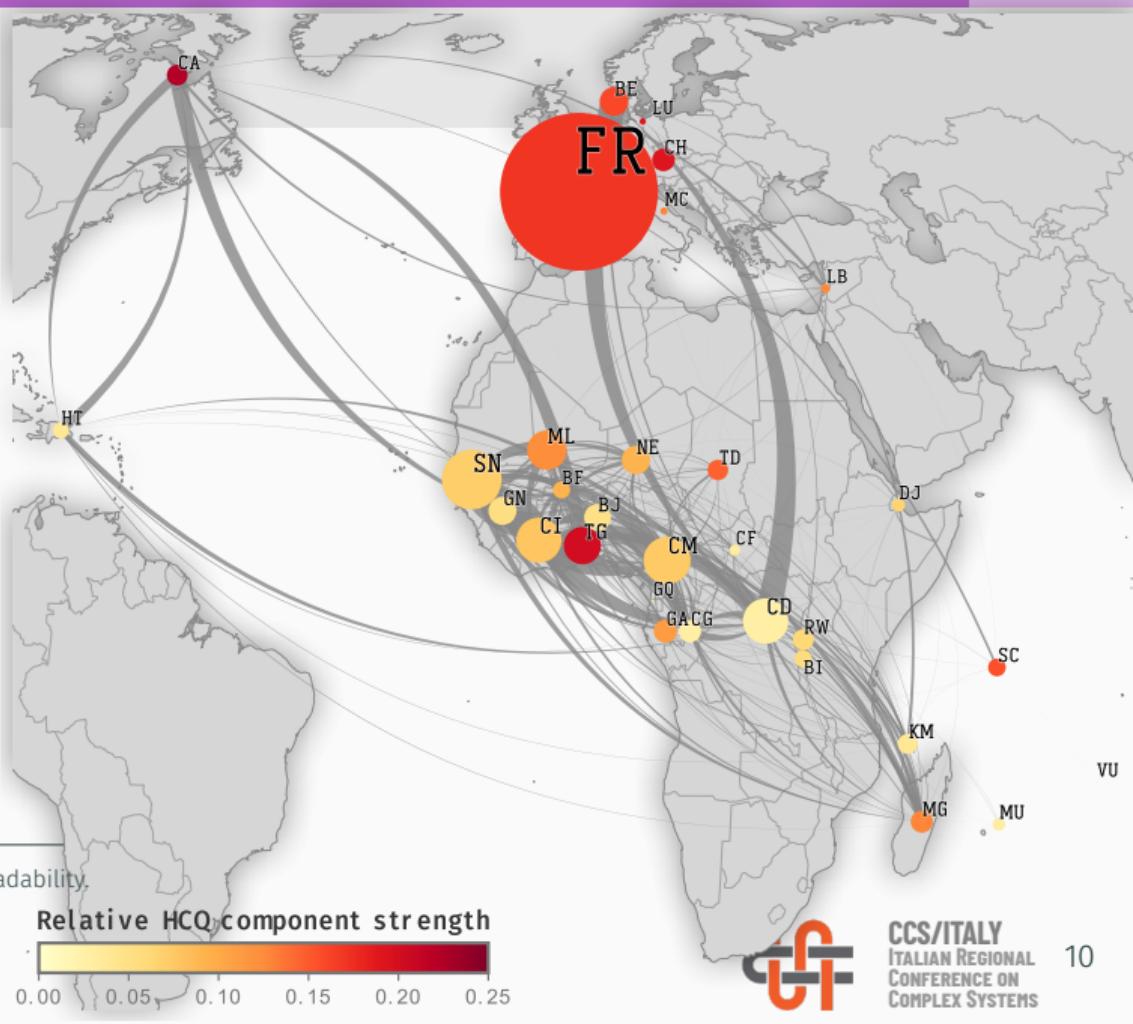
6 countries most involved : France,
Canada, Switzerland
Luxembourg, Belgium



Is HCQ debate international?

HCQ components distribution

HCQ components are mainly localized in Europe and Canada



 Finally...

Questions?

Joint work with:



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Jeremy Ward



Emilien Schultz



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Data at:

↗ <https://github.com/maurofaccin/DataCovHCQ>

Acknowledgements
Next_AIM project

