Information in times of COVID19: traditional media vs. on-line social networks

Hendrik Schawe, Laura Hernández, Mariano G. Beiró,
José-Ignacio Alvarez-Hamelin, and Dimitris Kotzinos

Introduction
1

- Exploratory study with focus on the New York Times and their Twitter followers
- other media outlets' followers as comparison
- the year 2020 offers a global pandemic, mass protests and a US presidential election
- we can observe how traditional media and a part of social media react to them

User-Similarity [1]
3

- assign each user a normalized vector
- each dimension corresponds to a topic
- the component of each dimension is proportional to the number of hashtags used belonging to the corresponding topic
- similarity of two users is their dot product
- similarity to a group of users is the dot product with their average vector
- for grouping we use follower-relation to a media account
- we measure the mean similarity of agents with their own group (self-similarity) and of selected other groups (cross-similarity)
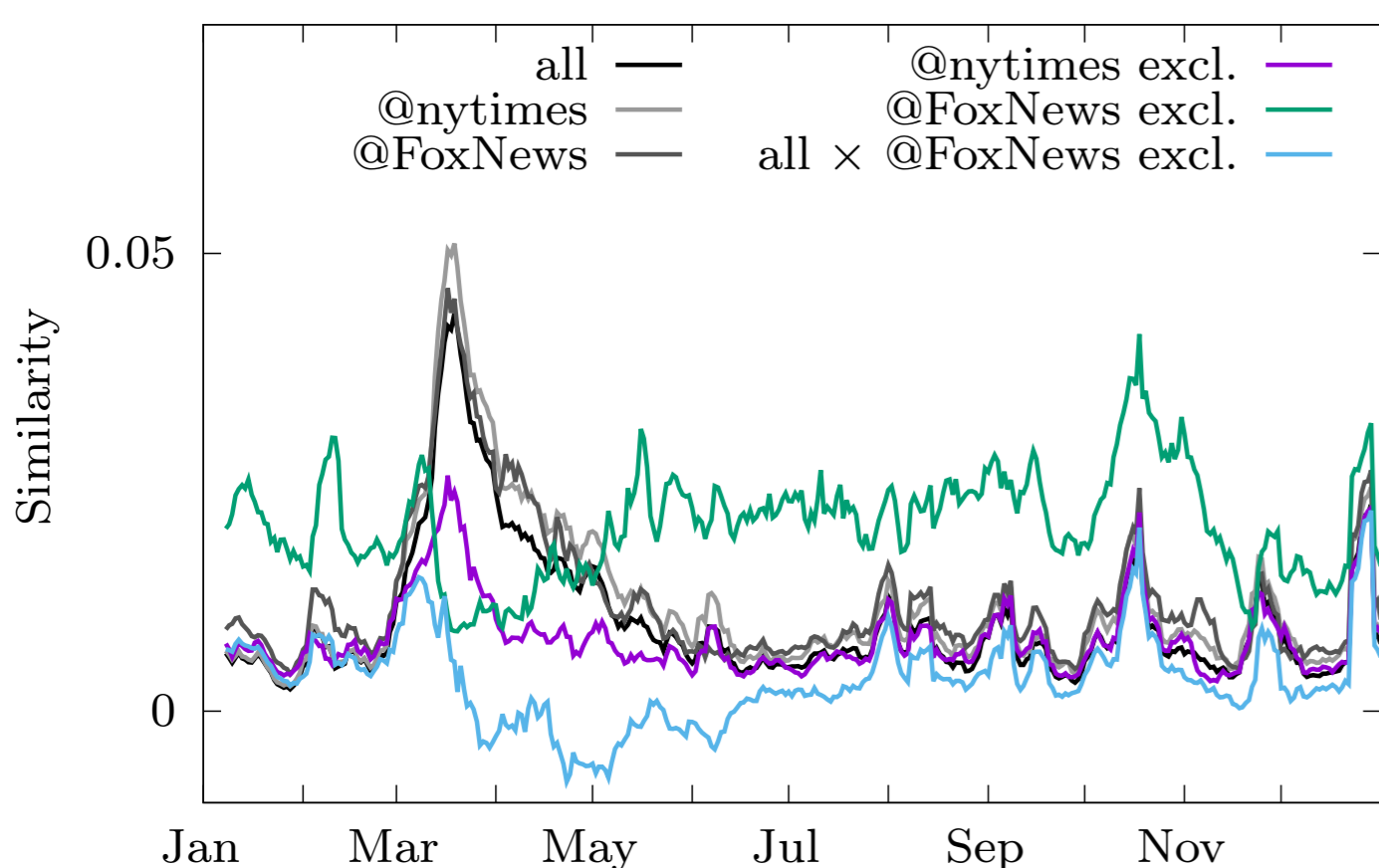

- we look at mostly self-similarites
  - all: user which follow at least one of 8 selected media accounts
  - @x: users which follow @x
  - @x excl.: users which follow only @x and none of the other 7 media accounts
  - × signals cross-similarity
- we observe that @FoxNews followers are genrally very similar in topics of interest
- but during covid they seem to be much less focused on one topic than the followers of other media
- in this plot we removed the topic #endsars (protests against police brutality in Nigeria), which caused a large spike in October through extremely active user (probably not bots, a large percentage gave "Nigeria" as their current location)

New York Times (and other traditional media) vs Twitter
2

- we collect all tweets of millions of followers of @nytimes (and of other traditional media's Twitter accounts)
- we analyze the dynamics of hashtag usage in Twitter and keywords associated to NYT articles

The entropy $S_t = \sum_i p_t(i) \ln p_t(i)$, where $p_t(i)$ is the ratio of unique users using the hashtag i during the rolling 7 day window t, shows whether one topic is dominating the discourse:
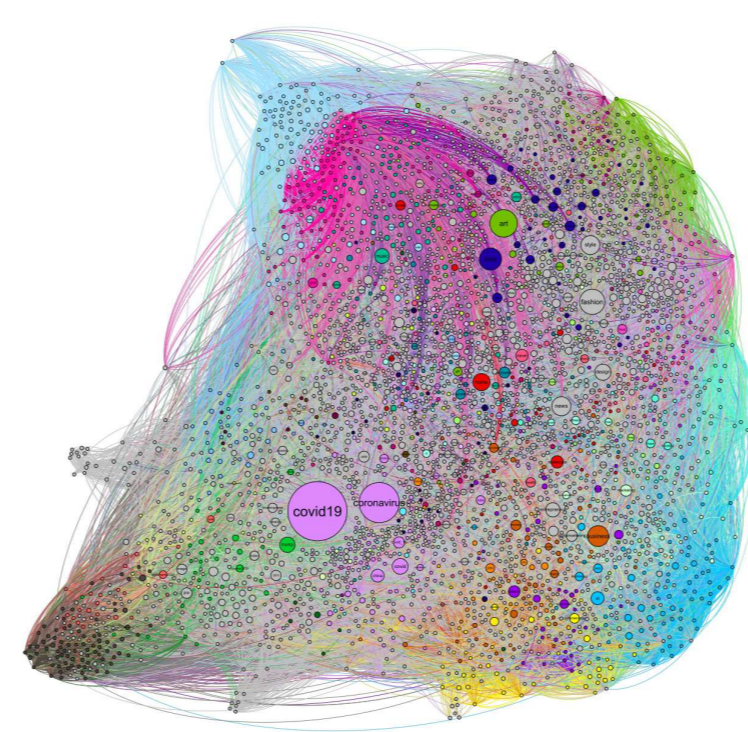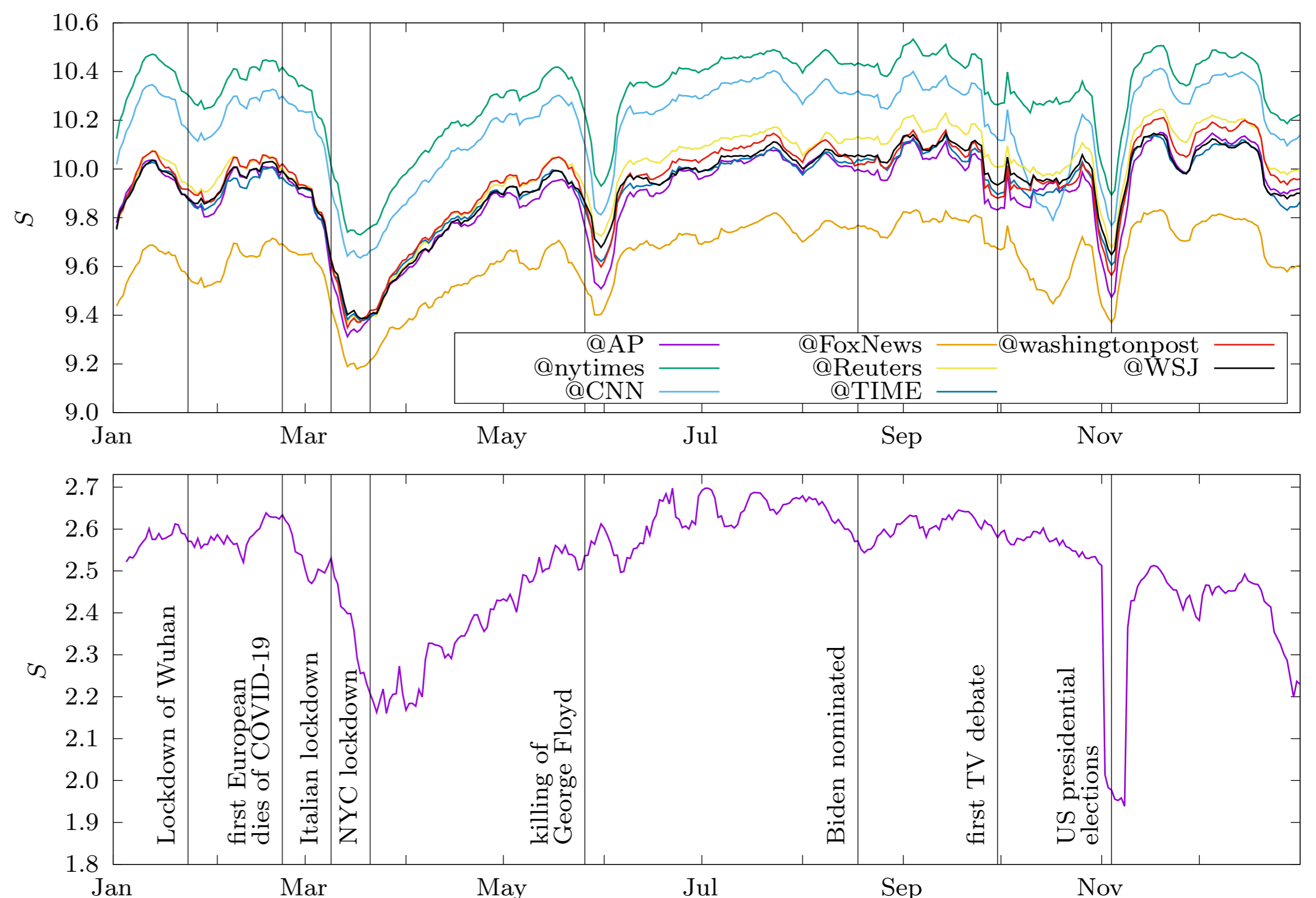

We use community detection to find *topics* on the graph of hashtags occurring in the same tweet.
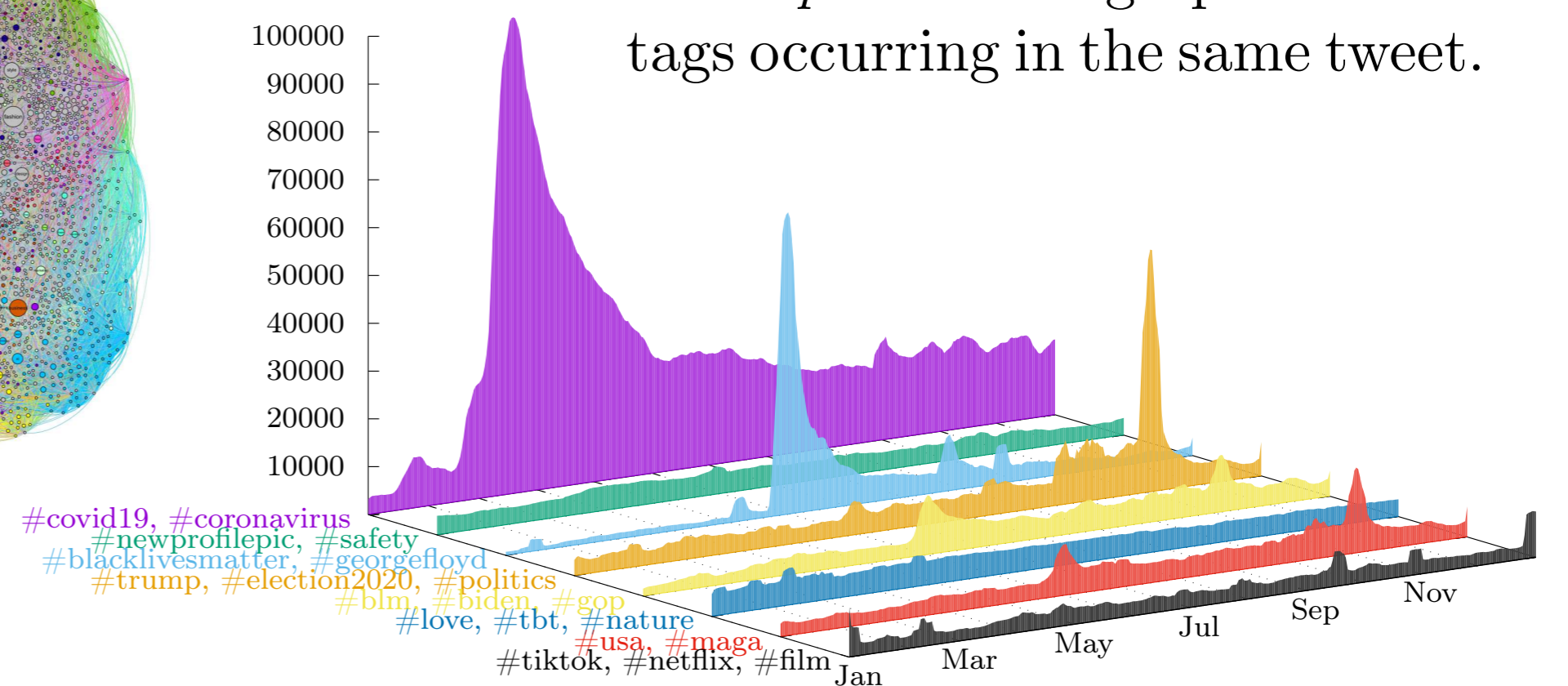
Delay between publication and reactions on Twitter
4

- sharp dropoff after ∼ 10 hours (yesterday's news)
- robust power-law-like behavior of direct interactions on Twitter, probably determined by Twitter's timeline
- slower but longer term reactions via the website
- robust shape, but more than 2× different median Δt values for different sections

- *link*: posting a link to the website
- *RT, reply, quote*: interacting with Tweets of @nytimes directly
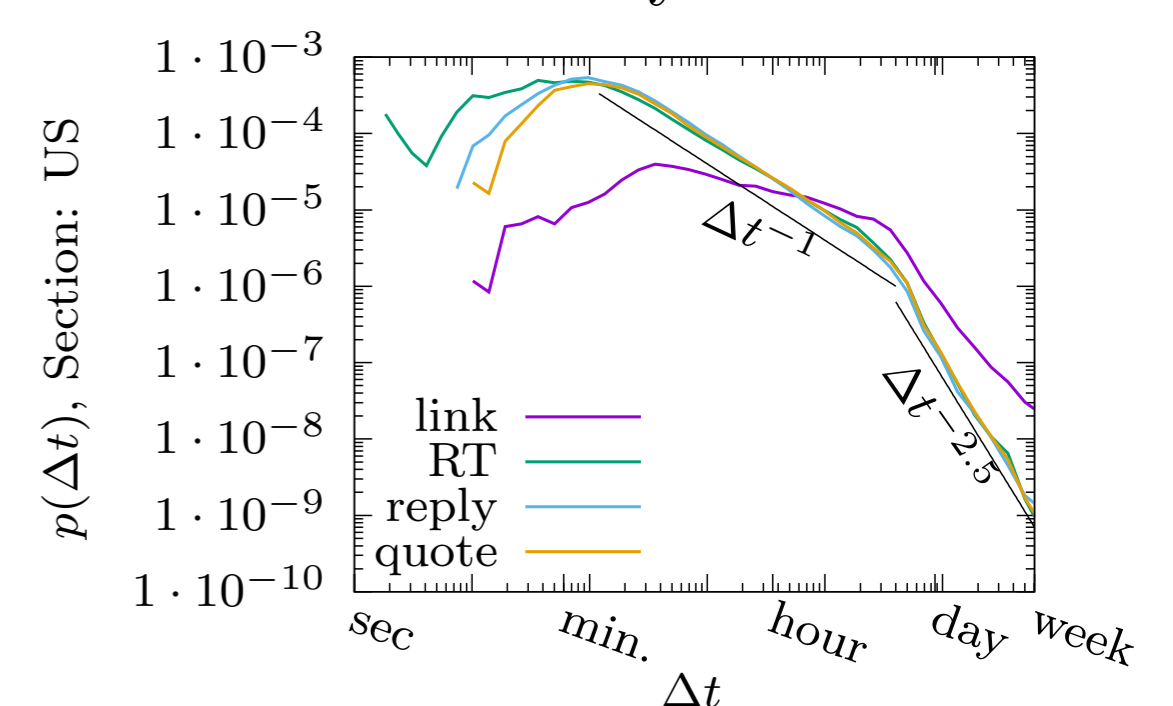
Bibliography

[1] Reyero, Beiró, Alvarez-Hamelin, Hernández, Kotzinos, EPJ Data Sci. **10**, 31 (2021)