Temporal graph analysis of the far-right social network Gab

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What is Gab?

"A social network that champions free speech, individual liberty and the free flow of information online." — gab.ai front page

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BBC Trending

Gab: Free speech haven or alt-right safe space?

Gab Is the Alt-Right Social Network Racists Are Moving to

Gab, the social media platform favored by the alleged Pittsburgh shooter, explained **Vox**

Technology

Pittsburgh shooting: Gab drops offline after attack

29 October 2018

What is already known about Gab?

What is Gab? A Bastion of Free Speech or an Alt-Right Echo Chamber?

Savvas Zannettou*, Barry Bradlyn[#], Emiliano De Cristofaro[†],
Haewoon Kwak[+], Michael Sirivianos*, Gianluca Stringhini[†], Jeremy Blackbu[...]

**High hate speech concentration, popular among alt-right celebs**

Elites and foreign actors among the alt-right: The Gab social media platform
by Yuchen Zhou, Mark Dredze, David A. Broniatowski, and William D. Adler

Hierarchical structure of follower/ repost distribution

From "Welcome New Gabbers" to the Pittsburgh Synagogue Shooting: The Evolution of Gab

Reid McIlroy-Young, Ashton Anderson

Evolution of hateful language in post content

Our work: studying Gab interactions over time

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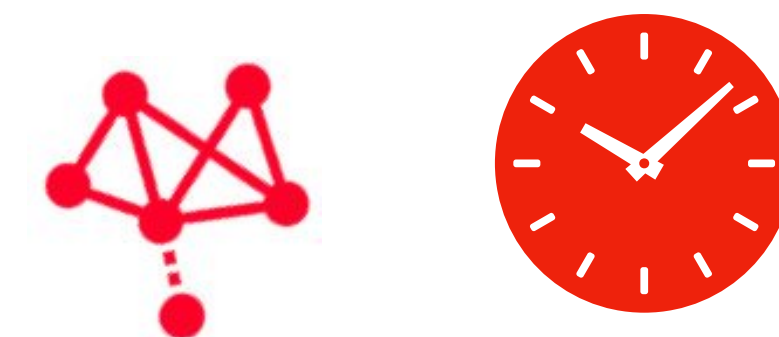
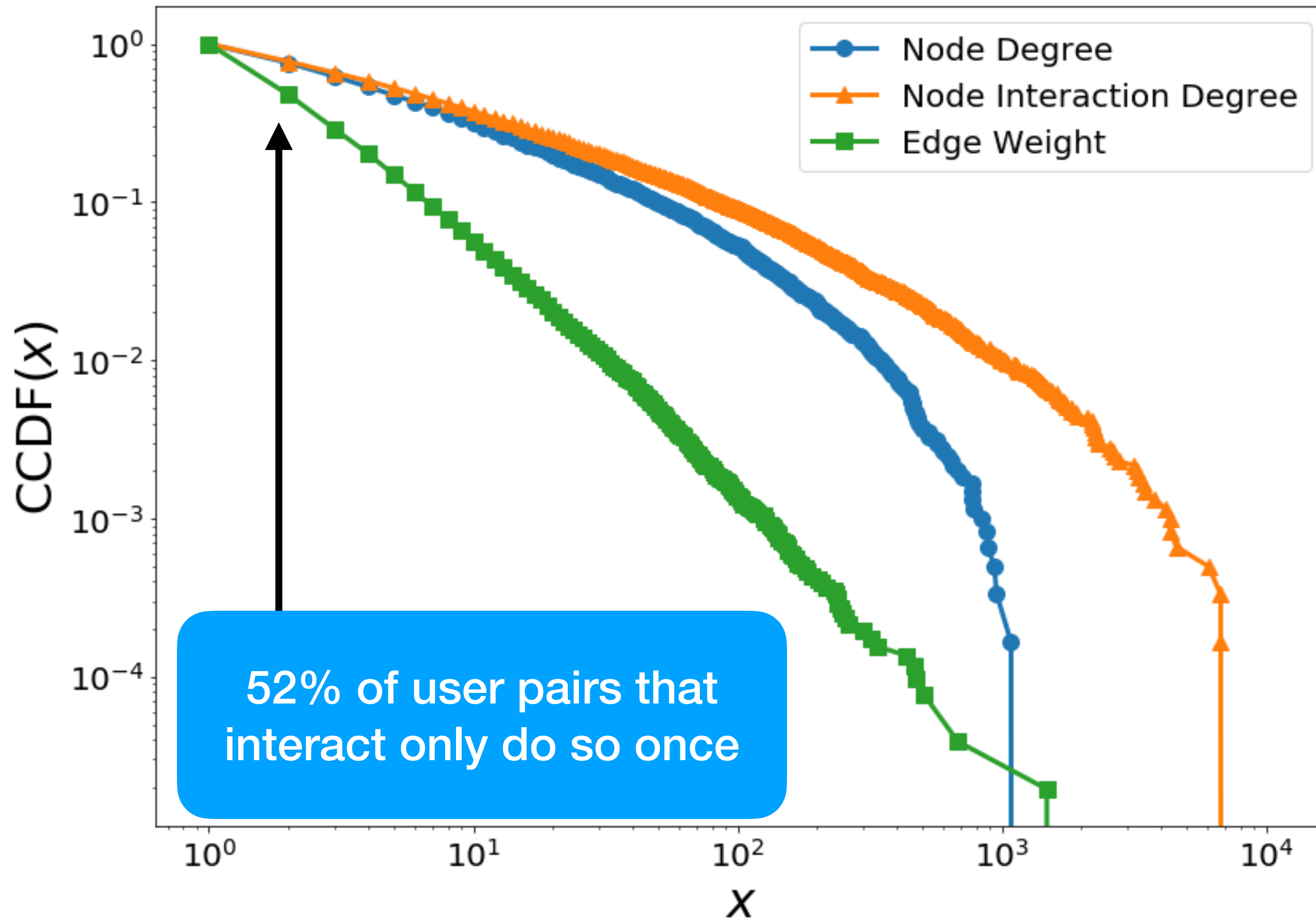# Dataset

- **All posts** between Aug 2016 and May 2018

- "Interactions" = post replies, same level as posts

Property	Quantity
Number of users	169,745
% of users that never reply	48.5 %
Number of posts	19,091,476
% as original posts	62.5 %
% as replies	37.5 %
% as self-replies	1.53 %

Interaction distributions

Interaction degree a different concept to degree

Edge weights are heavy tailed

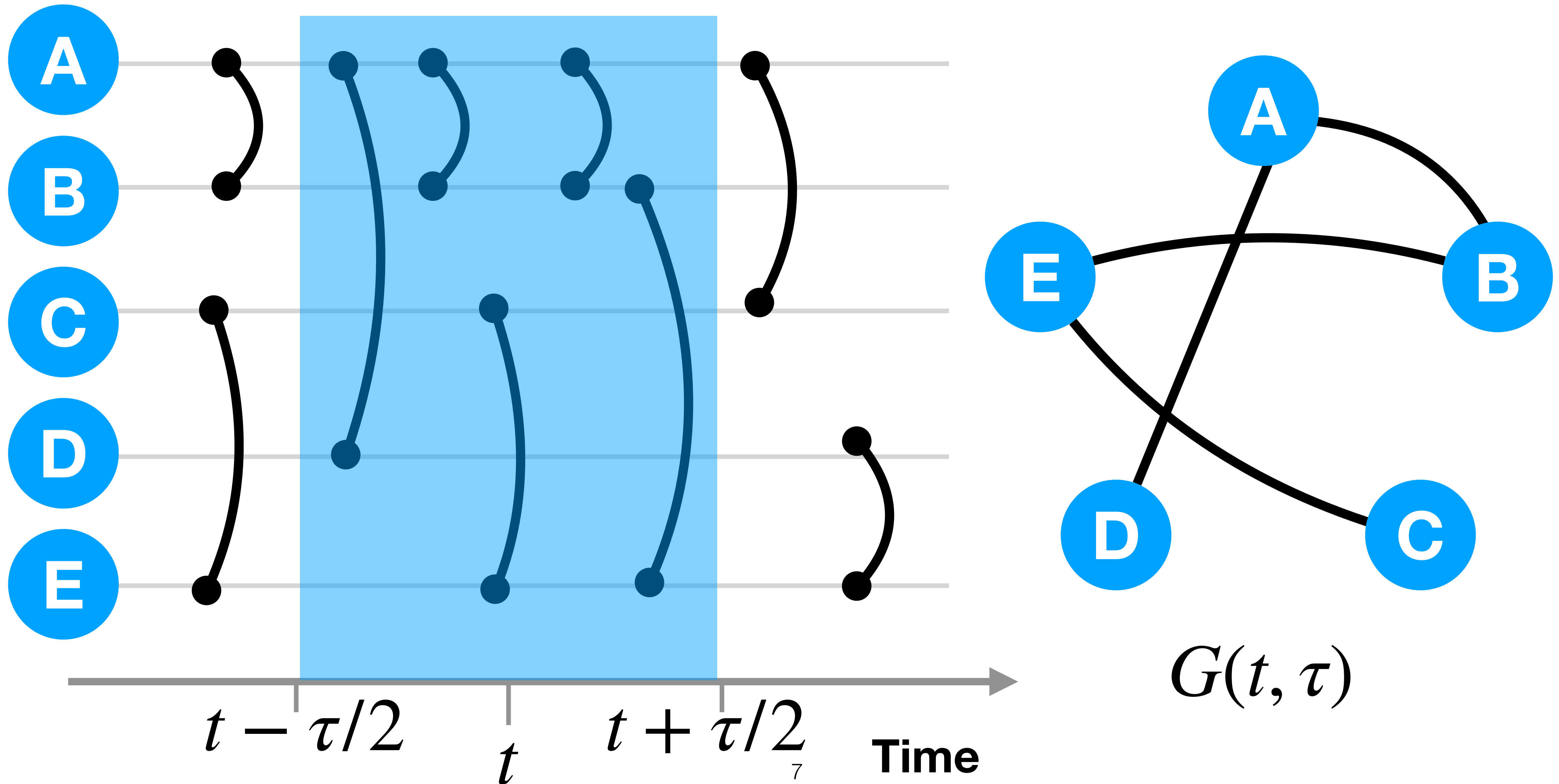52% of user pairs that interact only do so once

Our research questions

1. **Growth.** To what extent is Gab growing in its userbase and interactions, and what drives growth on the site?

2. **Cohesion**. Can Gab be considered a single community or disparate groups?

3. **Influence.** Is Gab consistently dominated by the same users or do these change over time?

Investigate using temporal interaction graphs
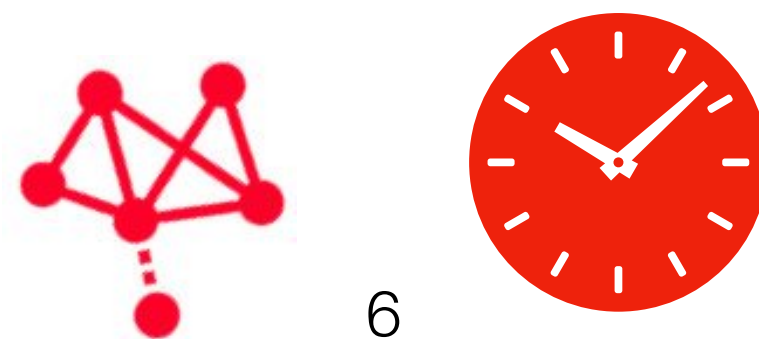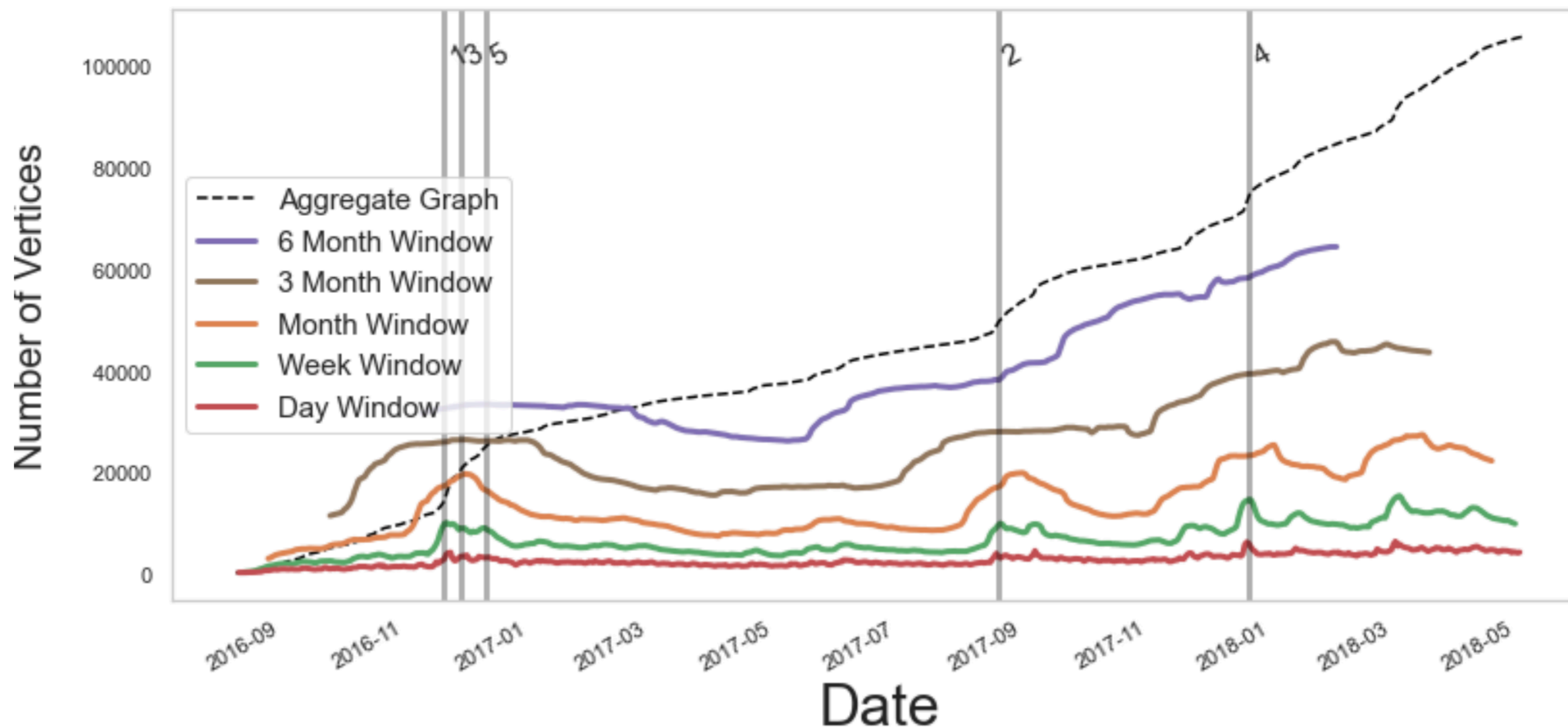
Temporal graph construction

$t - \tau/2$ t $t + \tau/2$ **Time**

$G(t, \tau)$

1. **Growth.** To what extent is Gab growing in its userbase and interactions, and what drives growth on the site?
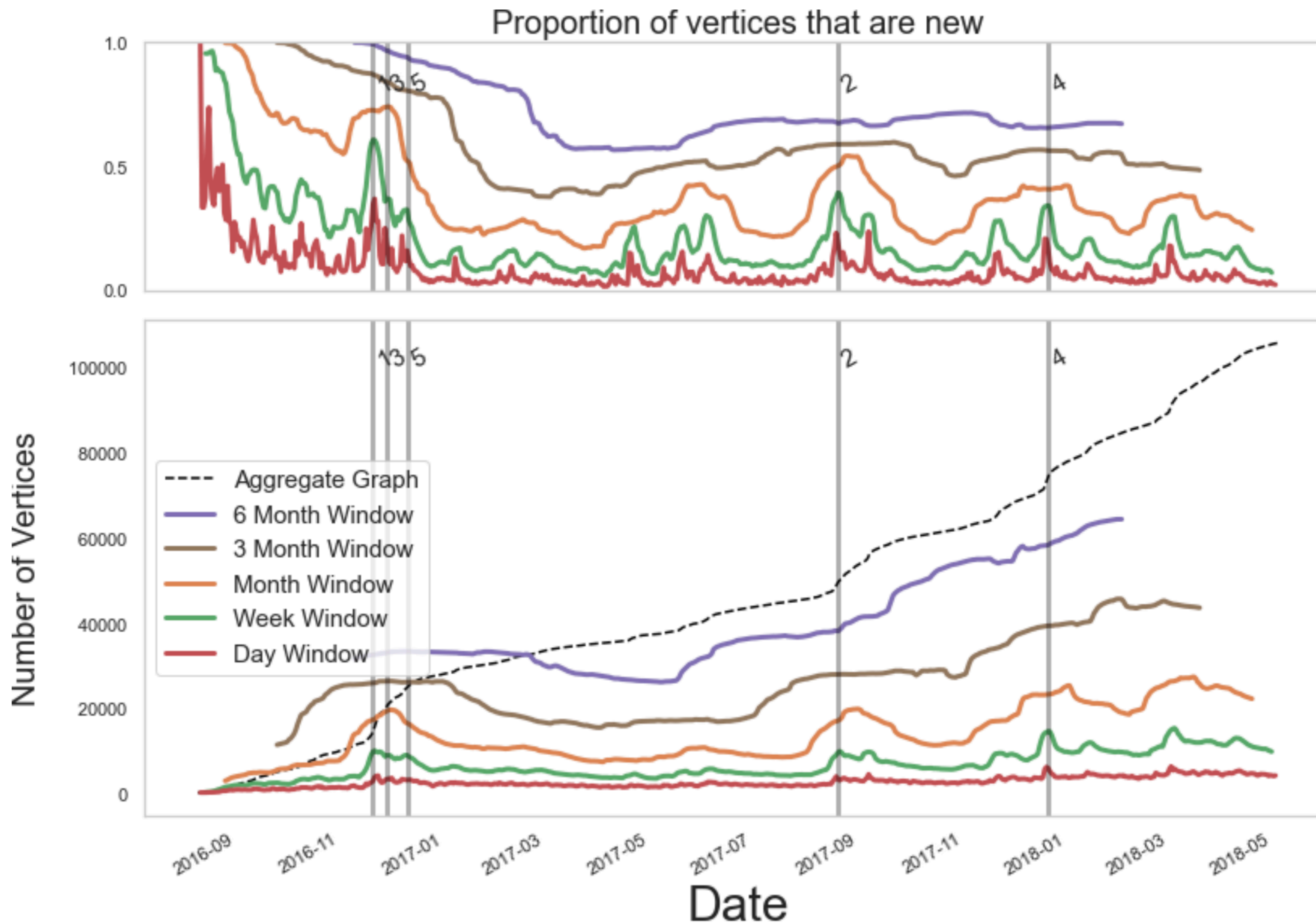
Number of users

Peak 1, 3, 5: Trump Election
Peak 2: Charlottesville Rally
Peak 4: Twitter deplatforming

19% of monthly users active on any given day (compared to 44% for Twitter)

Some events lead to a sustained increase in number of users
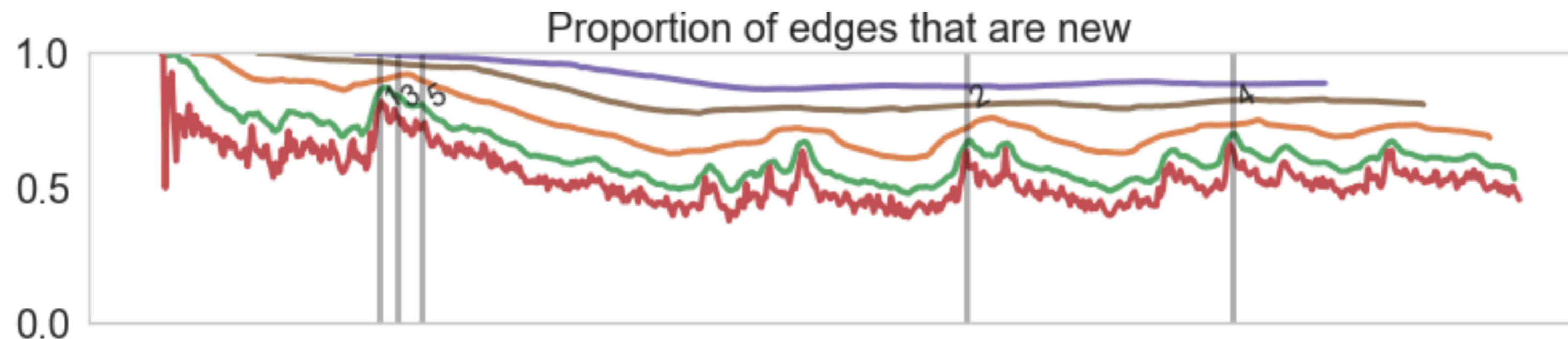
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Number of users

Proportion of vertices that are new

Peak 1, 3, 5: Trump Election
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Number of edges

Peak 1, 3, 5: Trump Election
Peak 2: Charlottesville Rally
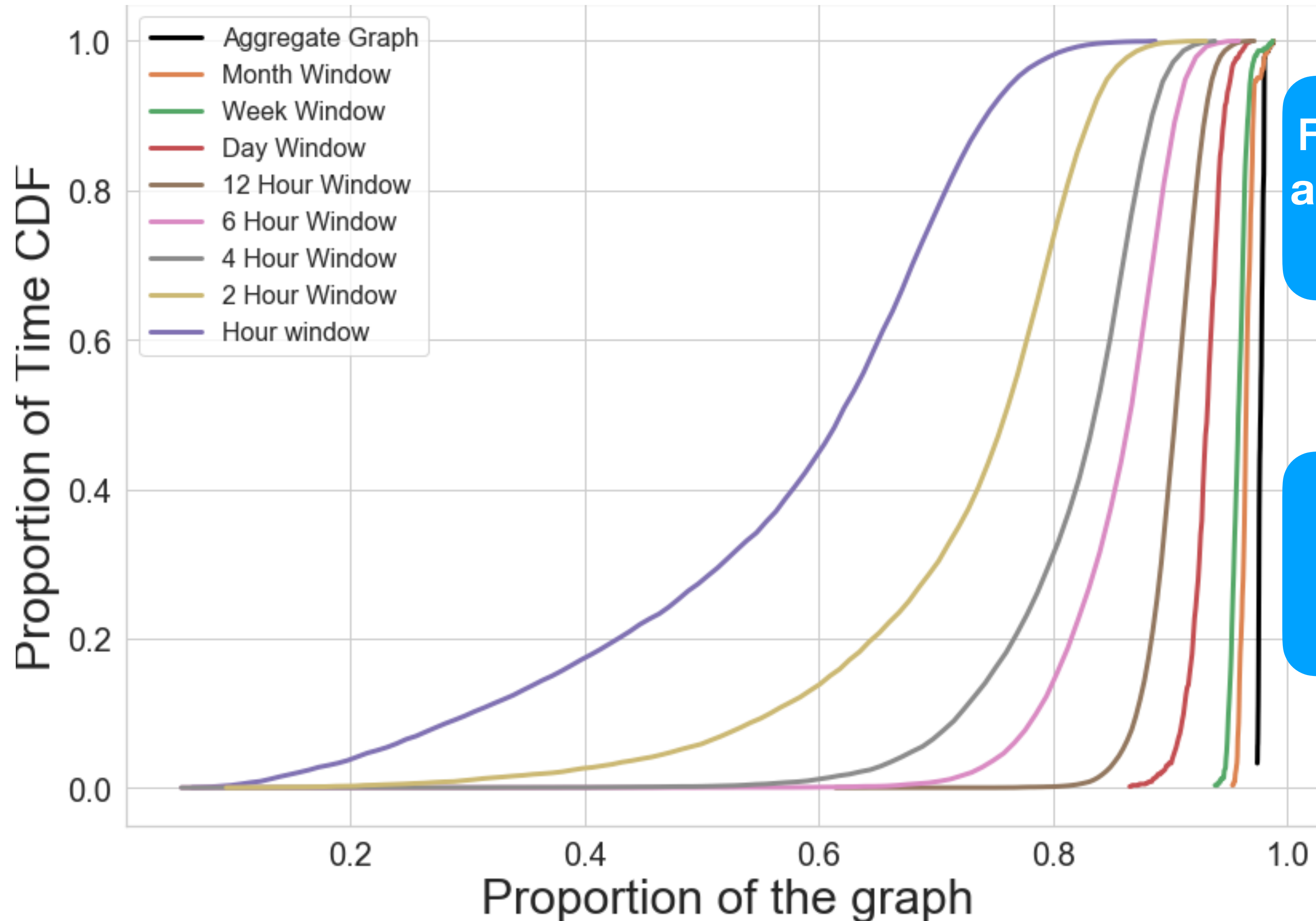Peak 4: Twitter deplatforming
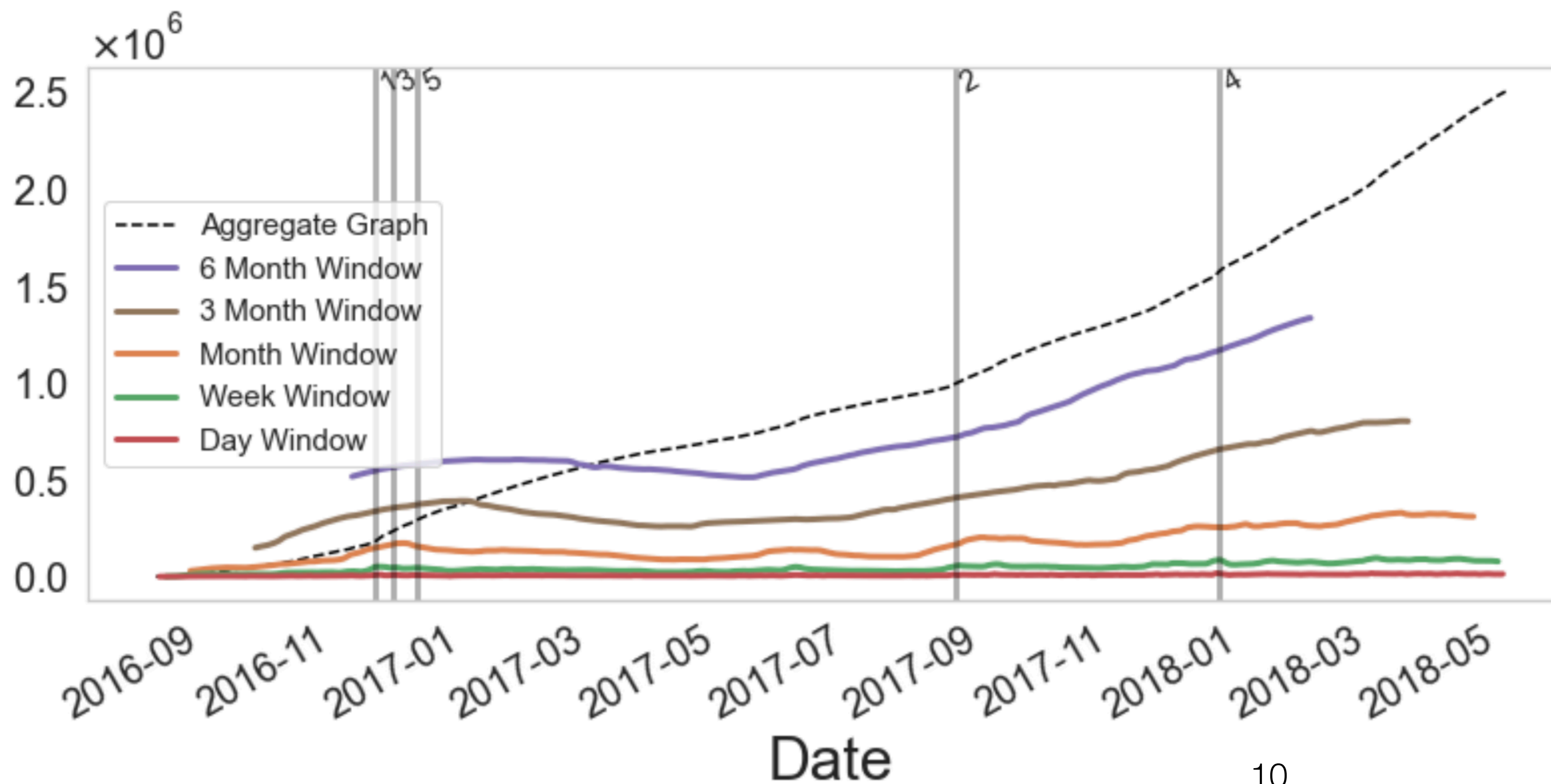
Over half of the edges on all timescales between users who have never previously interacted

Spikes in new edges associated with right-wing events of interest

2. Cohesion. Can Gab be considered a single community or disparate groups?
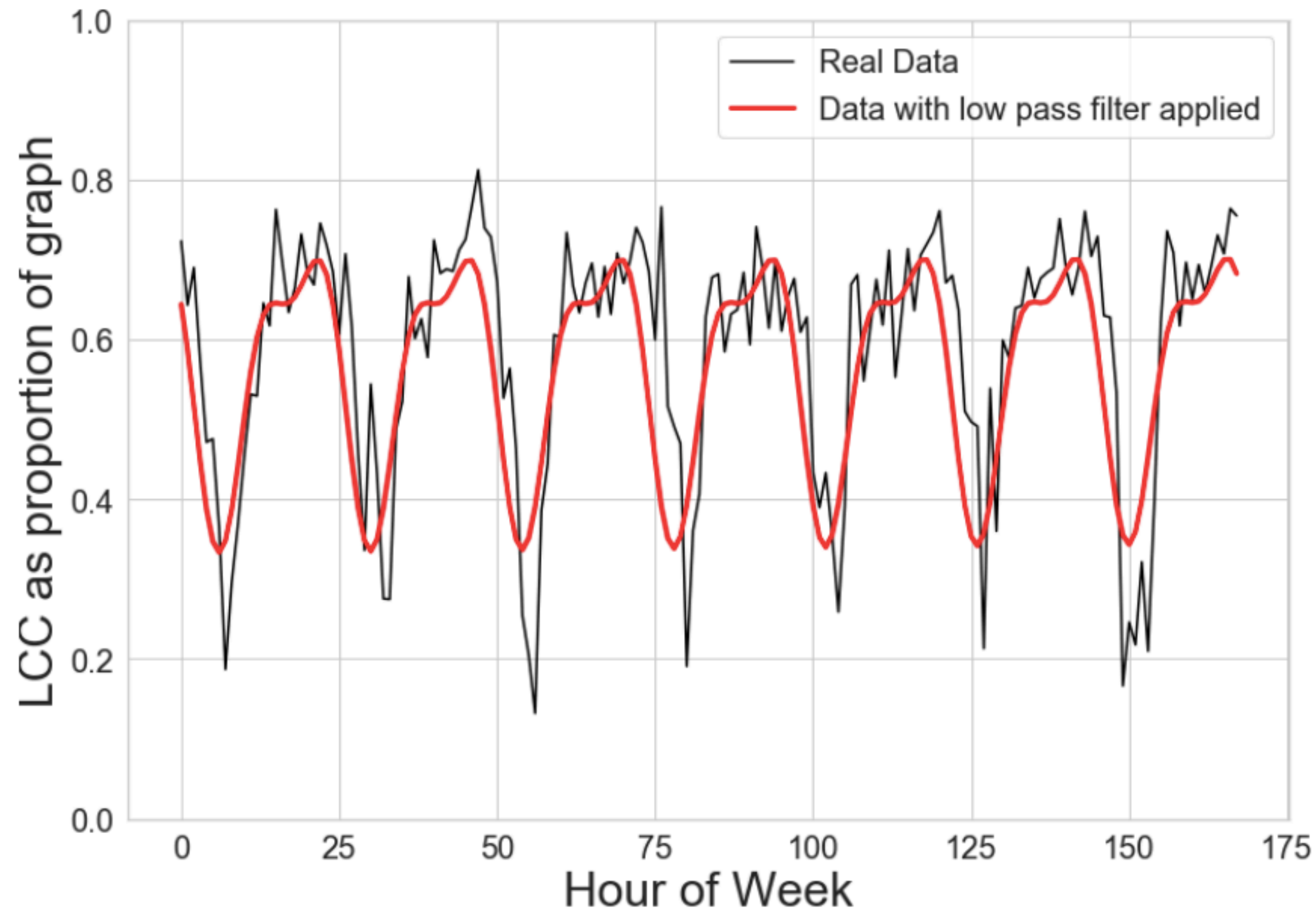
Relative size of largest connected component

For windows over a day size, there is always a giant component (LCC over 90% of the graph)

For hour-sized window, much more variation
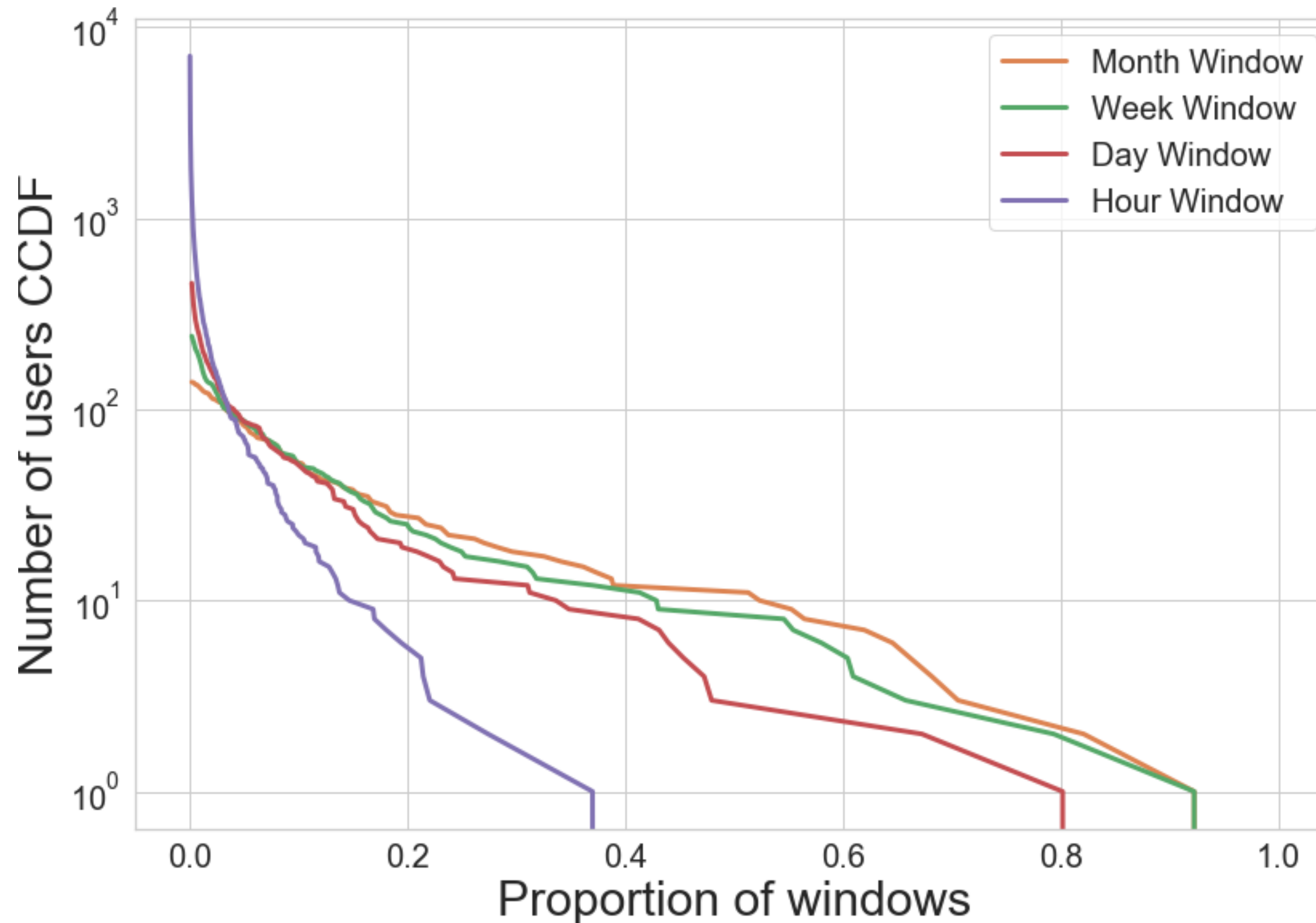
Hourly behaviour of the LCC

Forming and shattering of the largest component not before observed in online social networks

Two peaks with around 6hr gap, corresponding with EU and US userbase

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3. Influence. Is Gab consistently dominated by the same users or do these change over time?
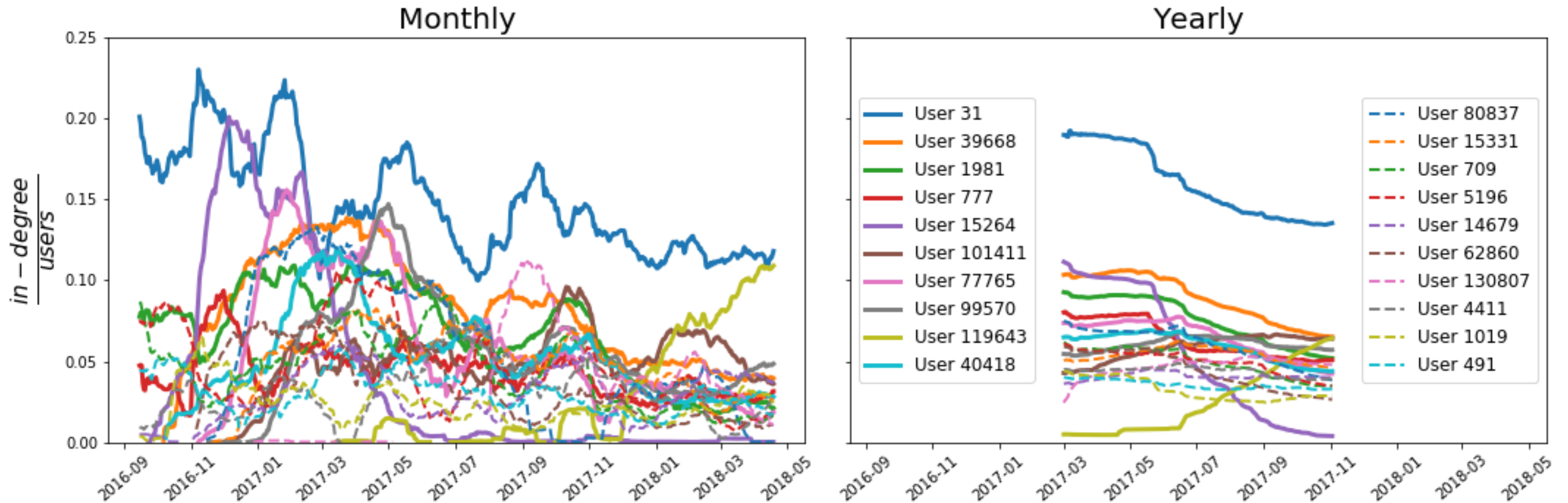
How long do users spend in the top ranks?

Ranking is by in-degree in terms of interactions with distinct users

Most users who enter the top 20 do so very fleetingly (800 who enter the daily top 20 once and never again)

Trajectories of all time top 20 users

Monthly

Yearly

Some users hold huge share of attention on Gab (> 20% of users)

More stable trend across year windows with users rarely overtaking each other

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Takeaways

- Gab active userbase is **event-driven**, with some events leading to sustained rises.

- Characterised by **interaction between strangers** rather than **maintaining of friendships**

- **Small core** of users who are dominant a large proportion of the time, with much **larger pool of users** who gain influence fleetingly.

- All insights obtained by studying the graph at **different timescales**

Thanks for listening! What are your questions?

Moving with the Times: Investigating the Alt-Right Network Gab with Temporal Interaction Graphs

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Raphtory
temporal graph analytics

CSCW Paper
https://dl.acm.org/doi/abs/10.1145/3479591

Link to Raphtory:
https://raphtory.readthedocs.io/en/master/

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