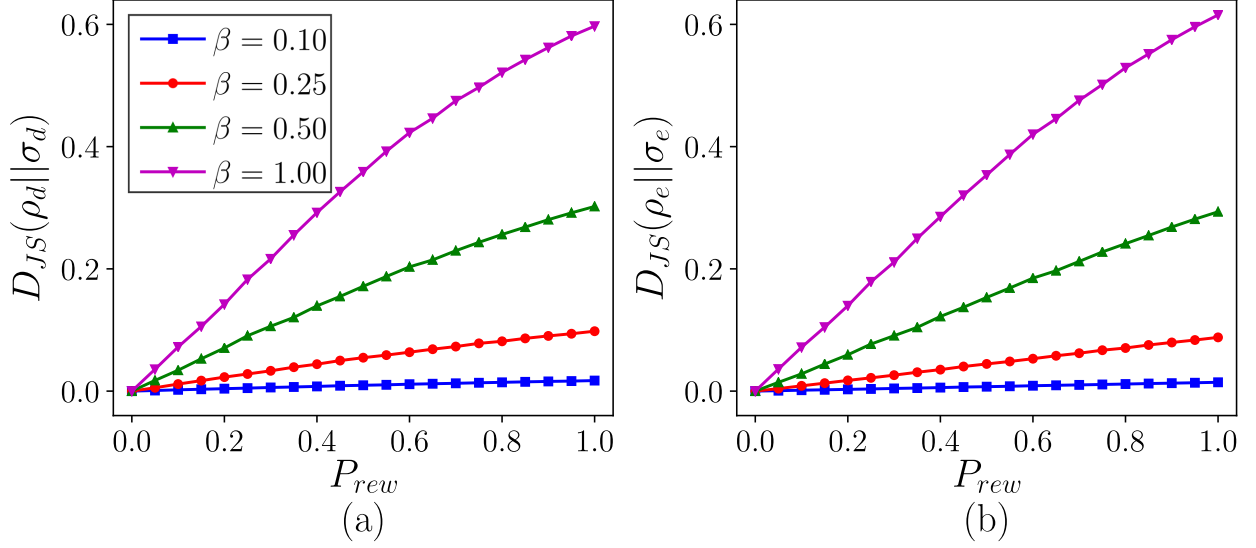


# Supplementary information for “Identification of network topology variations based on spectral entropy”

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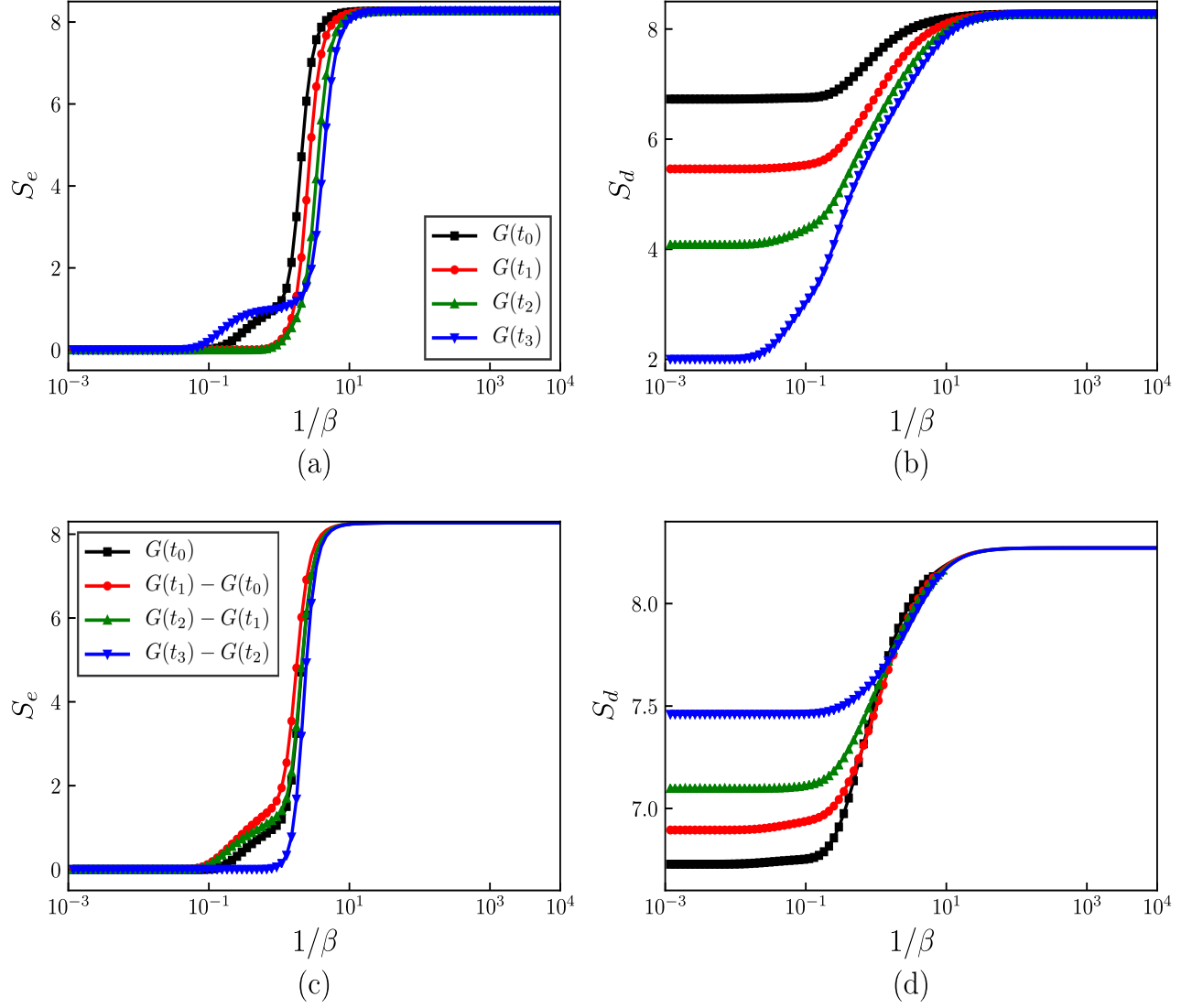
**Fig. S1:** The  $D_{JS}$  values as a function of rewiring probability  $P_{rew}$  for Watts and Strogatz's small-world network, where  $D_{JS}$  represents the difference between K-regular and WS small-world networks. (a) Based on the spectral entropy DD, dissimilarity values  $D_{JS}(\rho_d || \sigma_d)$  between K-regular and WS small-world networks. (b) Dissimilarity values  $D_{JS}(\rho_e || \sigma_e)$  between K-regular and WS small-world networks based on EE. The network size is  $N = 100$ ,  $\langle k \rangle = 4$ , all the results are averaged over 100 independent realizations.

**TABLE S1:** The second line shows the  $S_b$  of the email temporal network  $G(t_i)$ ,  $i = 0, 1, 2, 3$ . The fourth line shows the  $S_b$  of the network  $G(t_{i+1}) - G(t_i)$ ,  $i = 0, 1, 2$ .

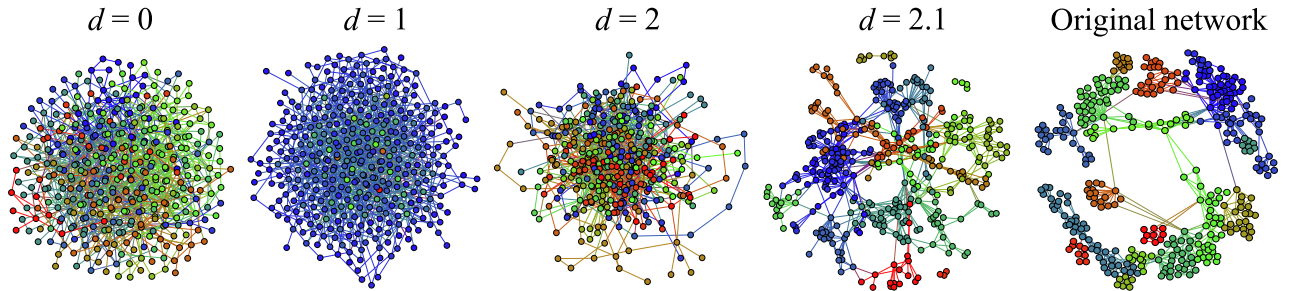
$S_b / \log_2 N$	$G(t_0)$	$G(t_1)$	$G(t_2)$	$G(t_3)$
Fig. 9(a)	0.8135	0.8938	0.9179	0.9318
$S_b / \log_2 N$	$G(t_0)$	$G(t_1) - G(t_0)$	$G(t_2) - G(t_1)$	$G(t_3) - G(t_2)$
Fig. 9(b)	0.8135	0.8312	0.8144	0.7992

**TABLE S2:** The second line shows the  $S_b$  of the email temporal network and their randomized models. The third line shows the  $S_b$  of the netscience network and their randomized models.

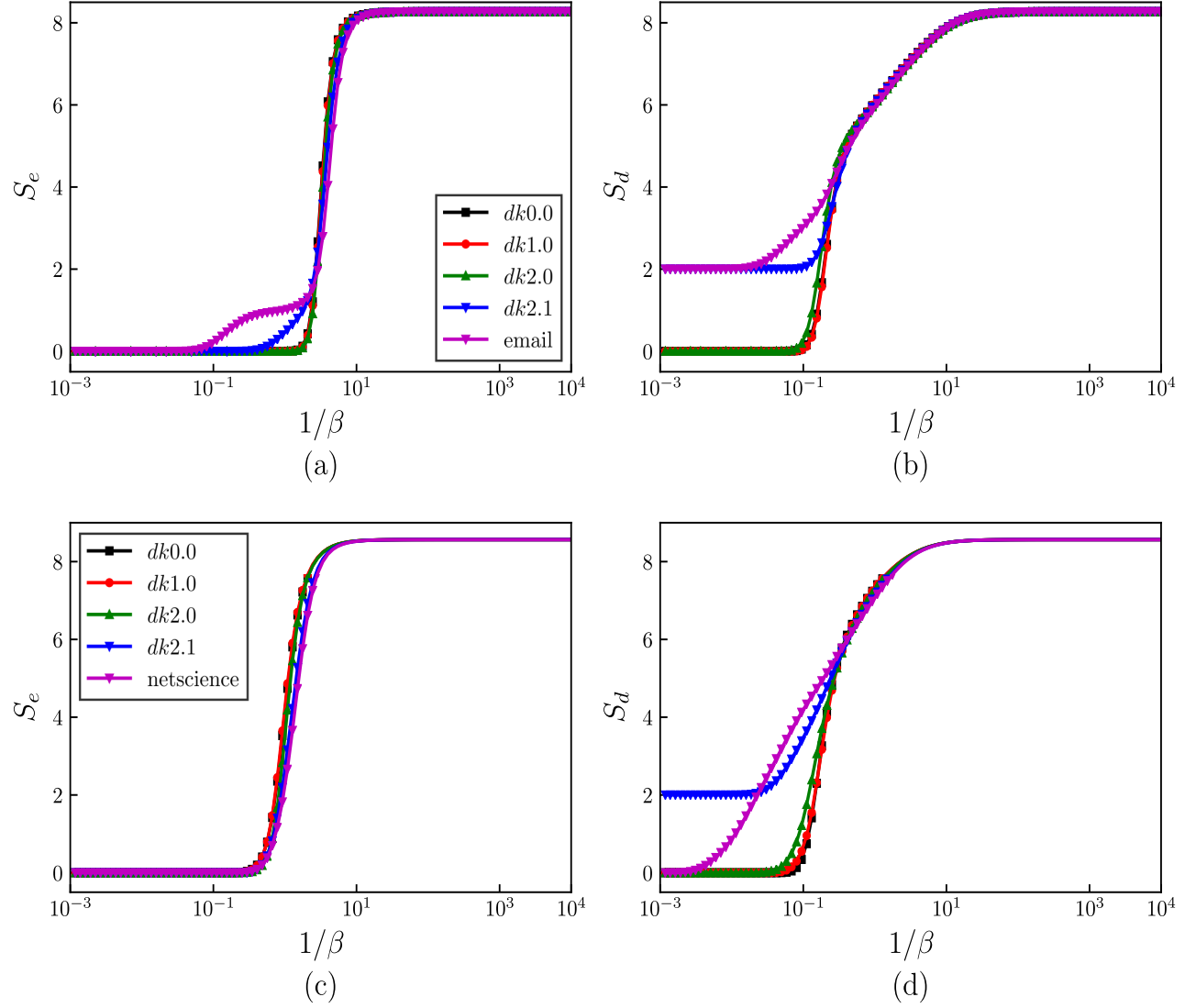
$S_b / \log_2 N$	$dk0.0$	$dk1.0$	$dk2.0$	$dk2.1$	original network
email	0.9338	0.9338	0.9334	0.9325	0.9318
netscience	0.9427	0.9429	0.9424	0.9395	0.9385



**Fig. S2:** The results of email temporal networks. (a) The  $S_e$  of  $G(t_i)$ ,  $i = 0, 1, 2, 3$ . (b) The  $S_d$  of  $G(t_i)$ . (c) The  $S_e$  of  $G(t_{i+1}) - G(t_i)$ ,  $i = 0, 1, 2$ . (d) The  $S_d$  of  $G(t_{i+1}) - G(t_i)$ .



**Fig. S3:** Collaboration network netscience and four randomized models. From left to right are  $0k$  randomized graph,  $1k$  randomized graph,  $2k$  randomized graph,  $2.1k$  randomized graph, and original network, respectively.



**Fig. S4:** (a) Shows the  $S_e$  of the email temporal network and their randomized models. (b) Shows the  $S_d$  of the email temporal network and their randomized models. (c) Shows the  $S_e$  of the netscience network and their randomized models. (d) Shows the  $S_d$  of the netscience network and their randomized models.