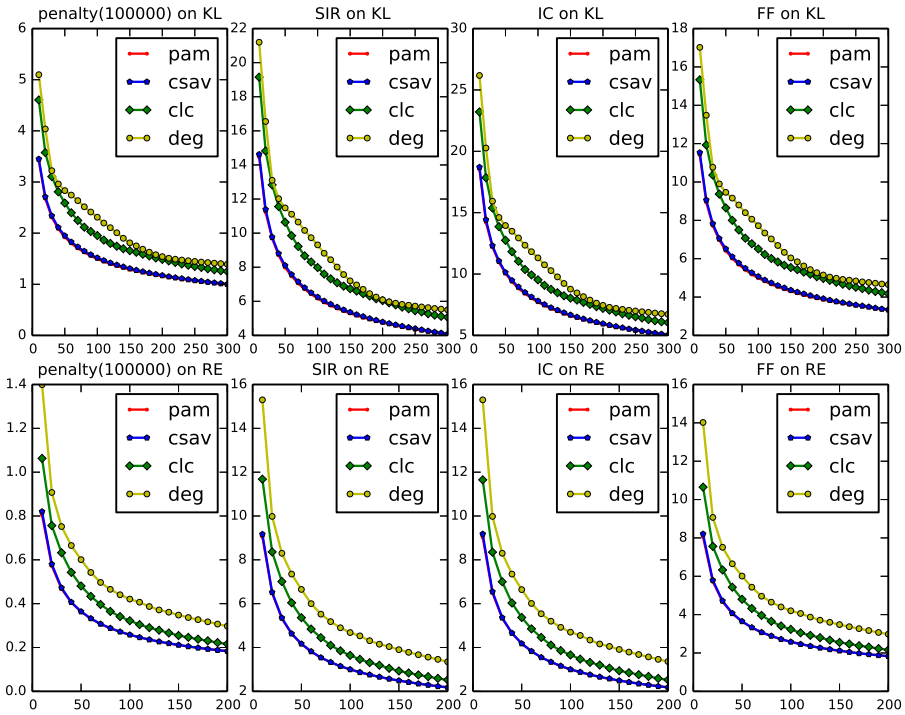

Fig. 1. The penalty and propagation processes over KL, $\beta = 4, |V| = 30,000$ and RE $T = 0.02, |V| = 10,000$

In Fig. 1, we vary k from 10 to 300 in KL, $\beta = 4, |V| = 30,000$ and from 10 to 200 in RE, $T = 0.02, |V| = 10,000$. It is straightforward to observe that: (1) For any k, the average detection time monotonically increases with penalty. (2) For any k, the penalty and average detection time of csav stay close to pam and are well below the clc and deg, which illustrates the robustness of csav against k. (3) As k increases, the average detection time decreases with diminishing gradient, which is similar to the penalty.