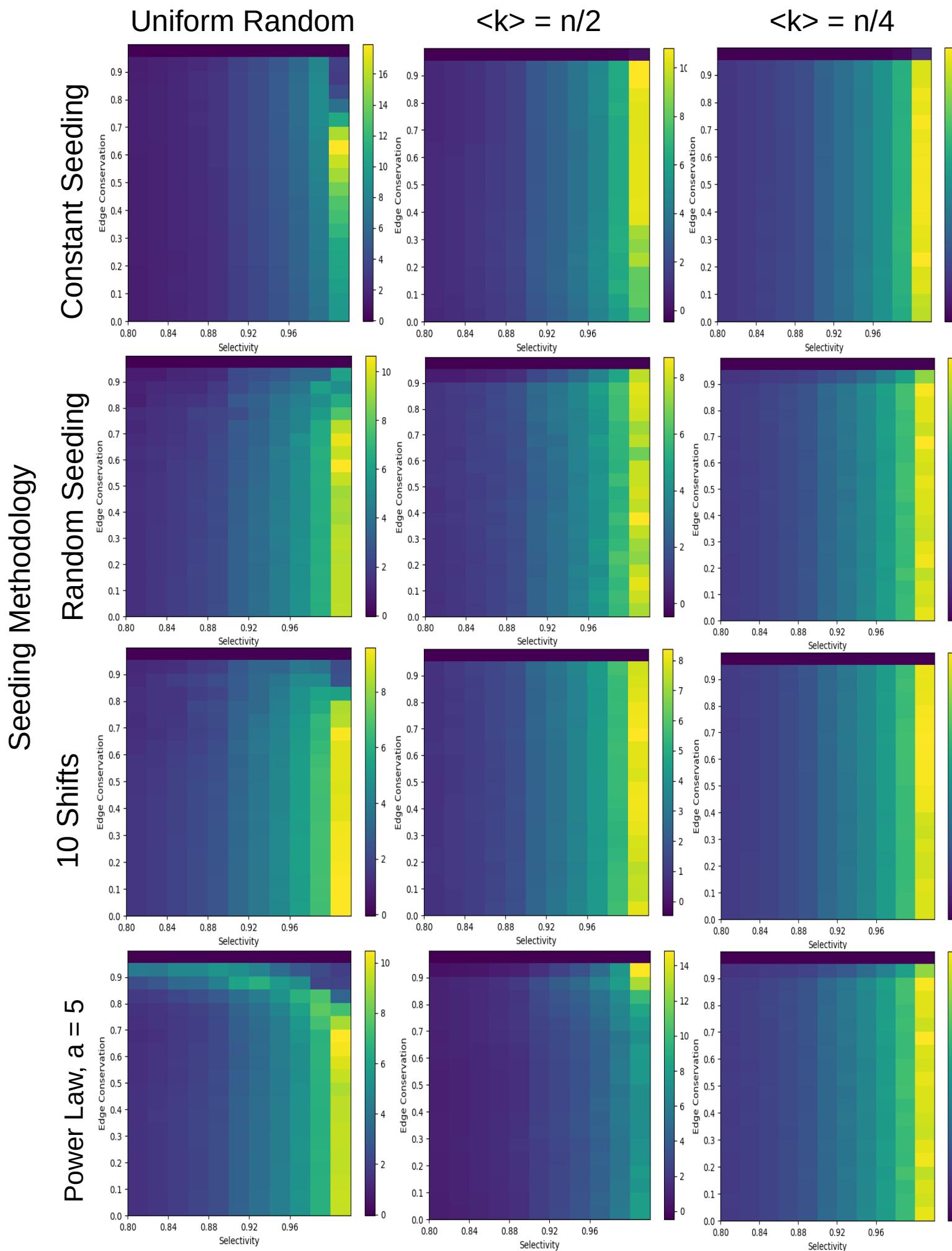


Grid-Search Plots

- 60 Nodes
- 25 Simulations per Ensemble
- 10 delta parameter value
- 600 Runs maximum
- 200 Run equilibrium distance
- K ranges of $k=n/4, n/2, n$
- For effective distances, lower (darker) numbers are better:
$$\text{Eff. Dist. Diff} = ED_{\text{final}} - ED_{\text{Initial}}$$
- Selectivity: 0.8-1.0, Edge Conservation 0.0-0.95

Average All to All Effective Distances Differences

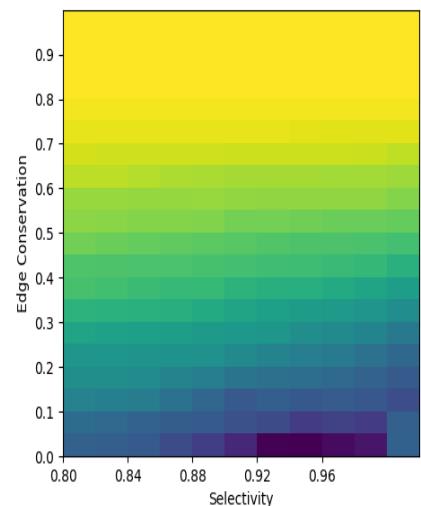
Network Structures



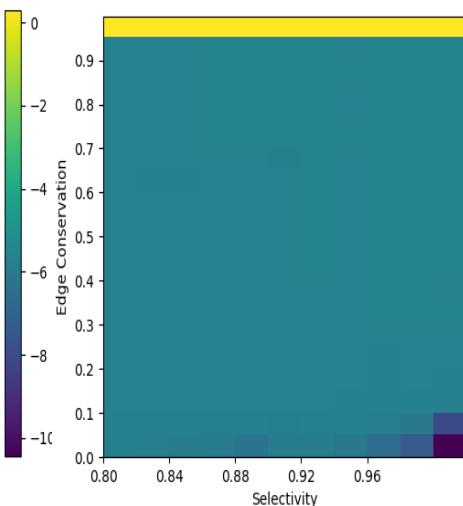
Effective Distance to Source Network Structures

Eff. Dist. Differences

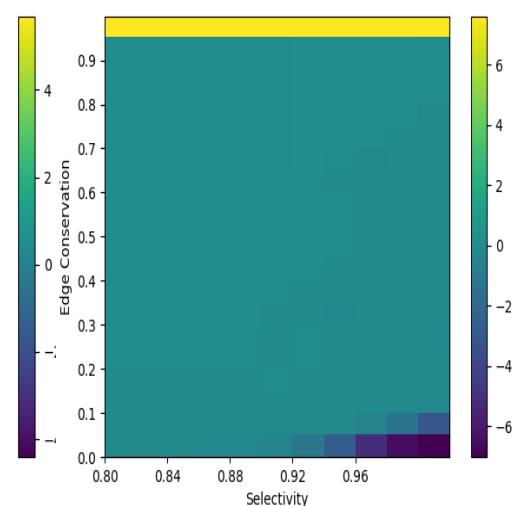
Uniform Random



$\langle k \rangle = n/2$

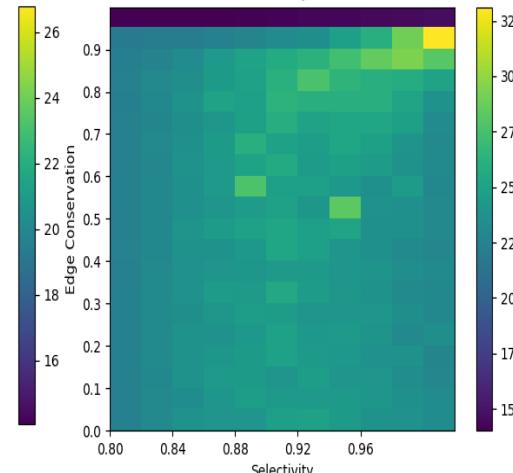
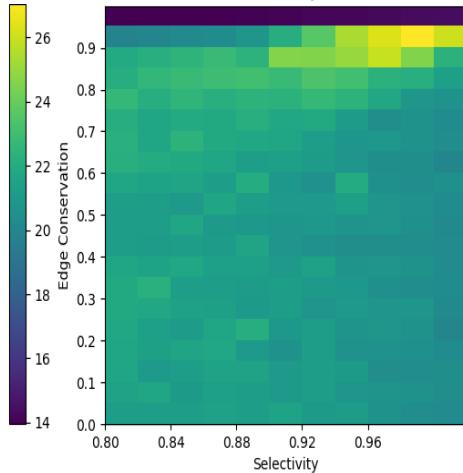
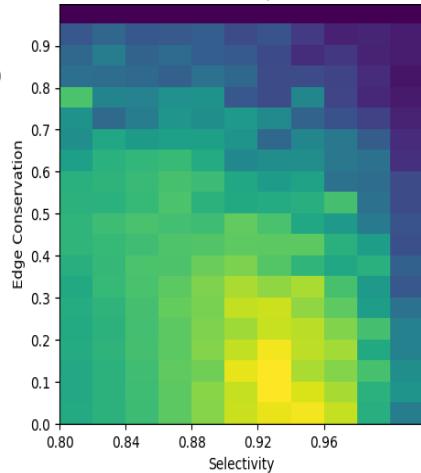


$\langle k \rangle = n/4$

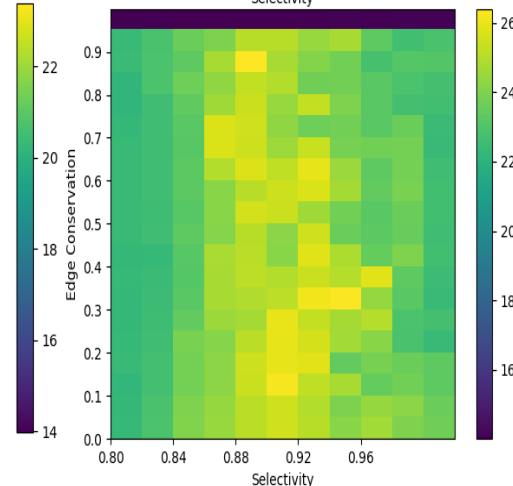
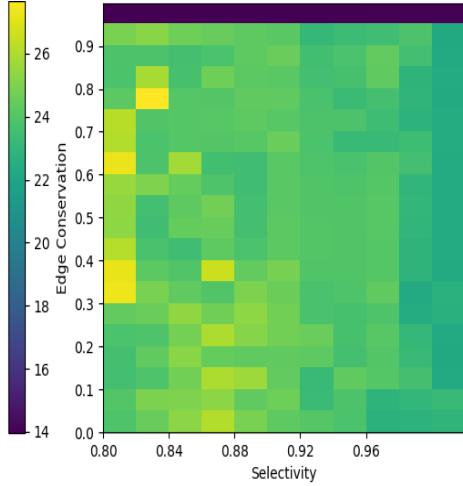
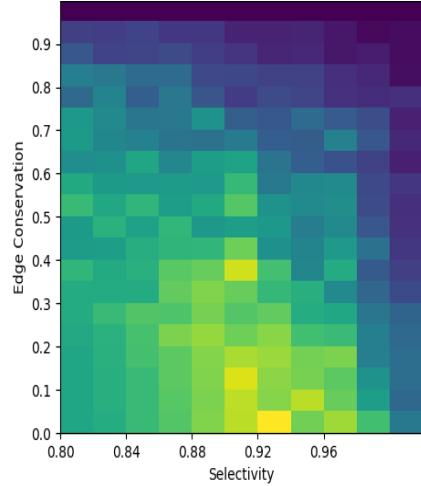


Eff. Dist. Averages Over Entire Simulation

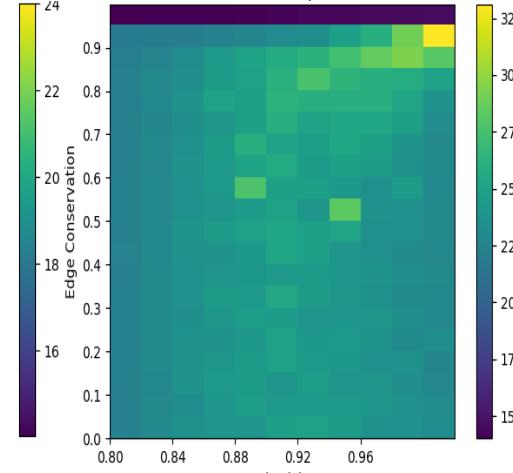
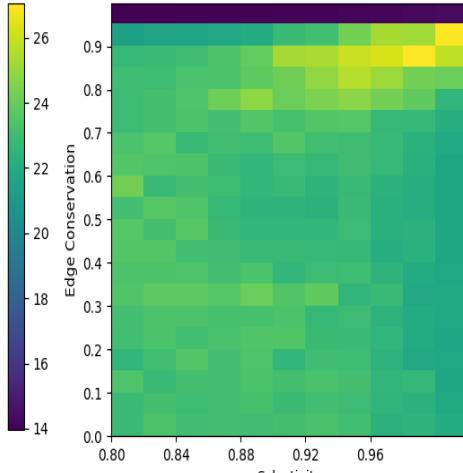
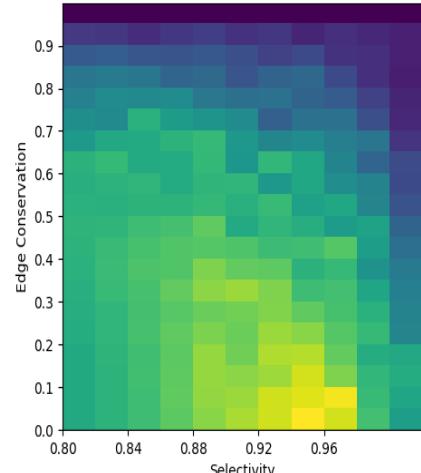
Random Seeding



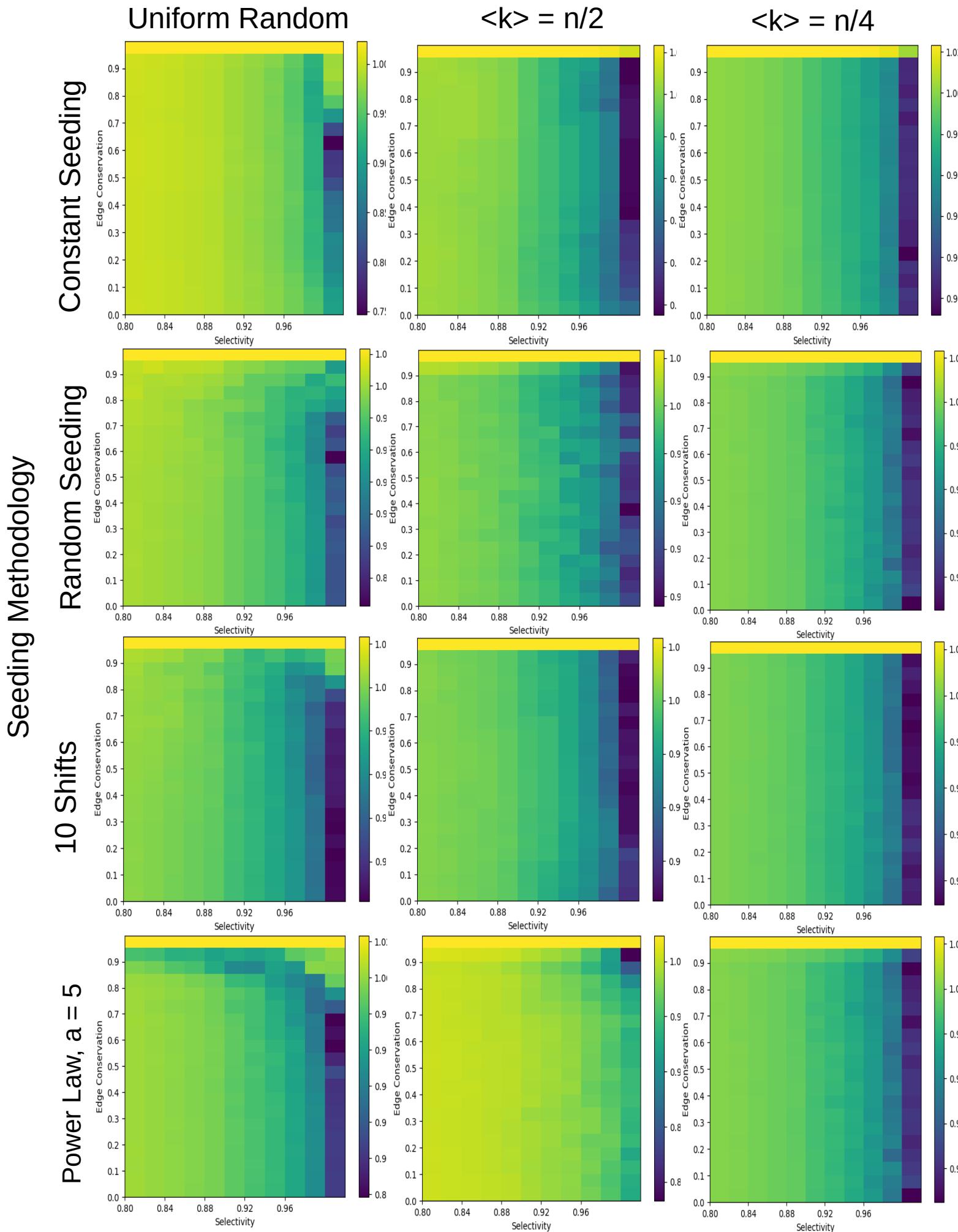
10 Shifts



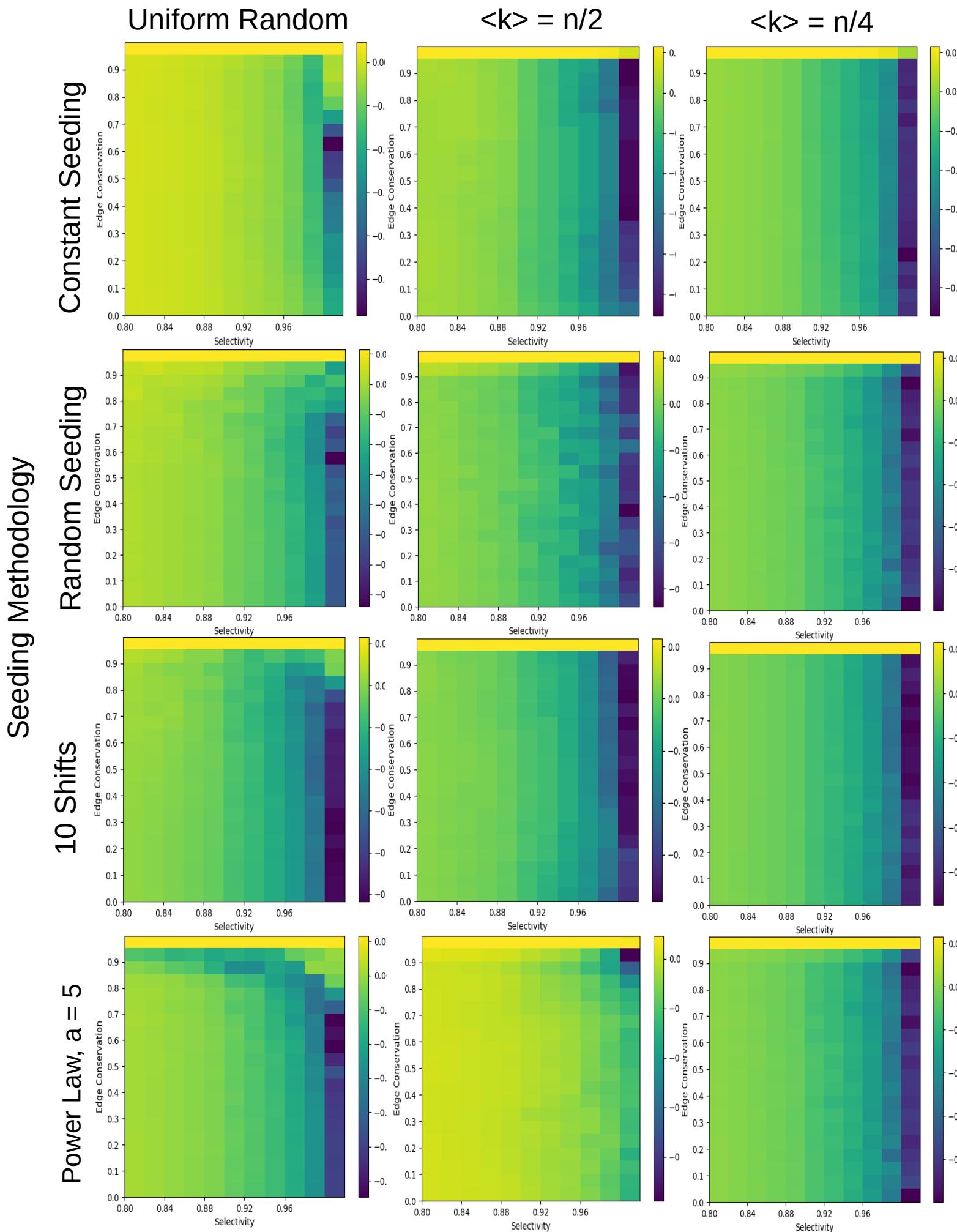
Power Law, $\alpha = 5$



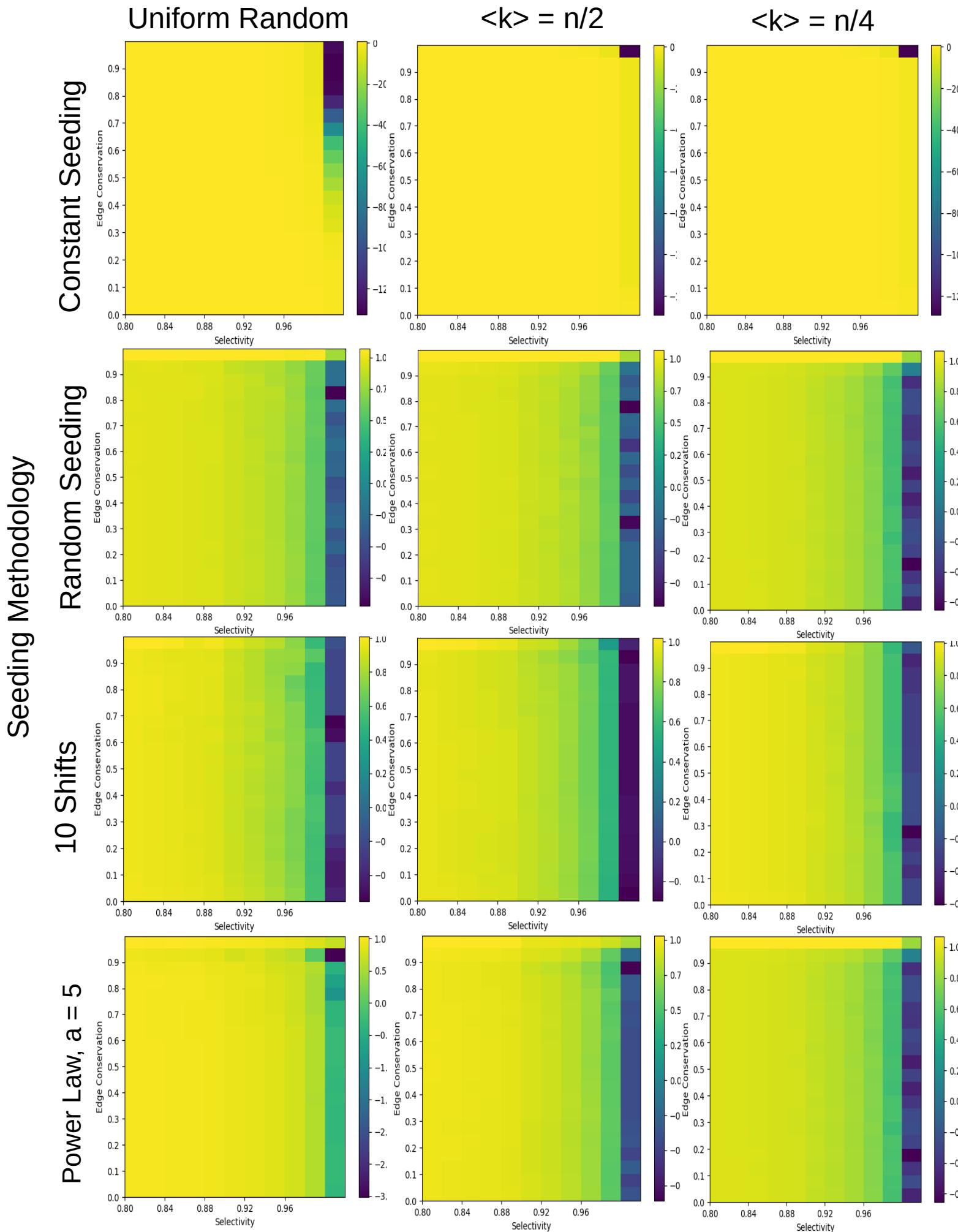
Diffusion Efficiencies (E_{Diff})



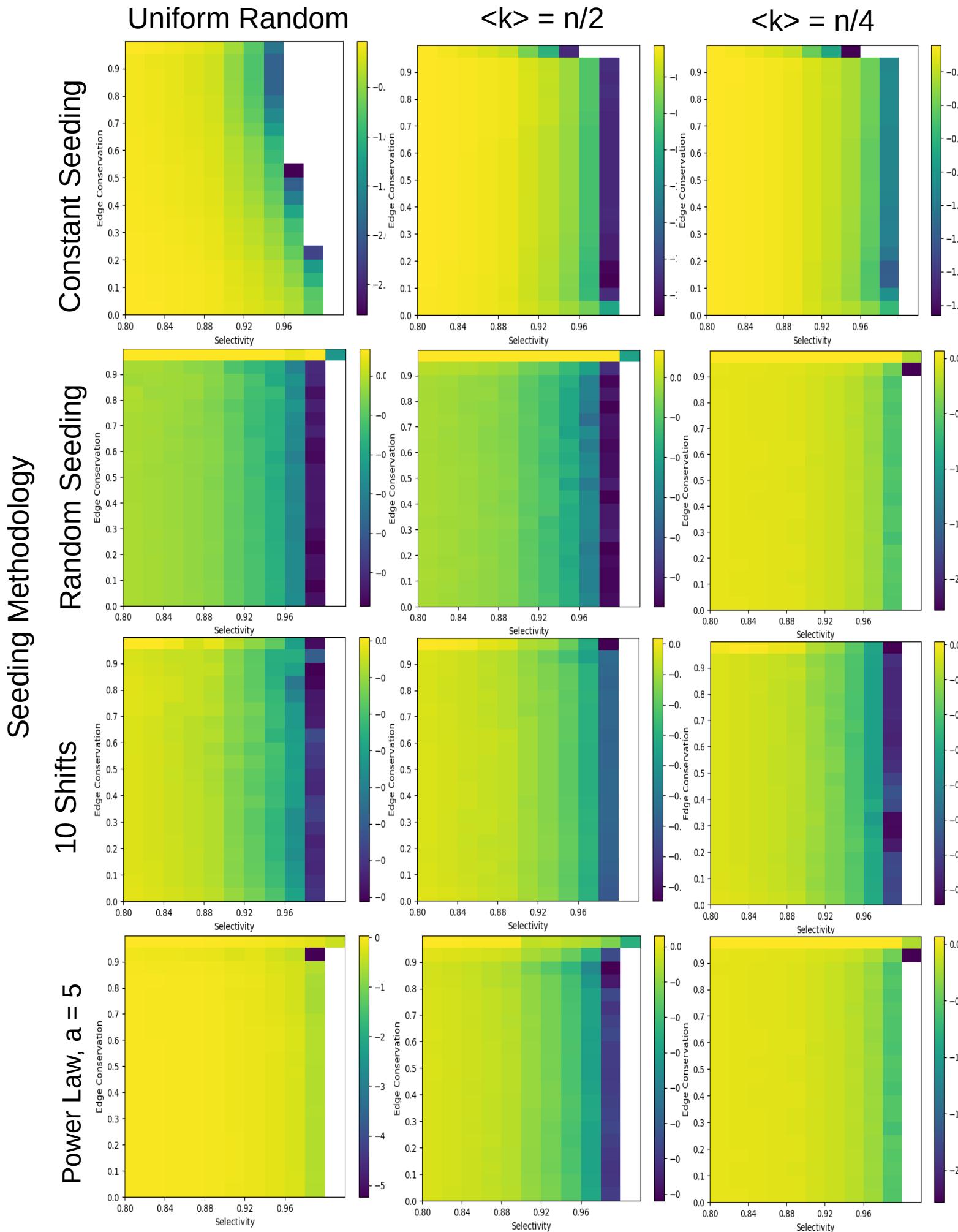
Log Diffusion Efficiencies (E_{Diff})



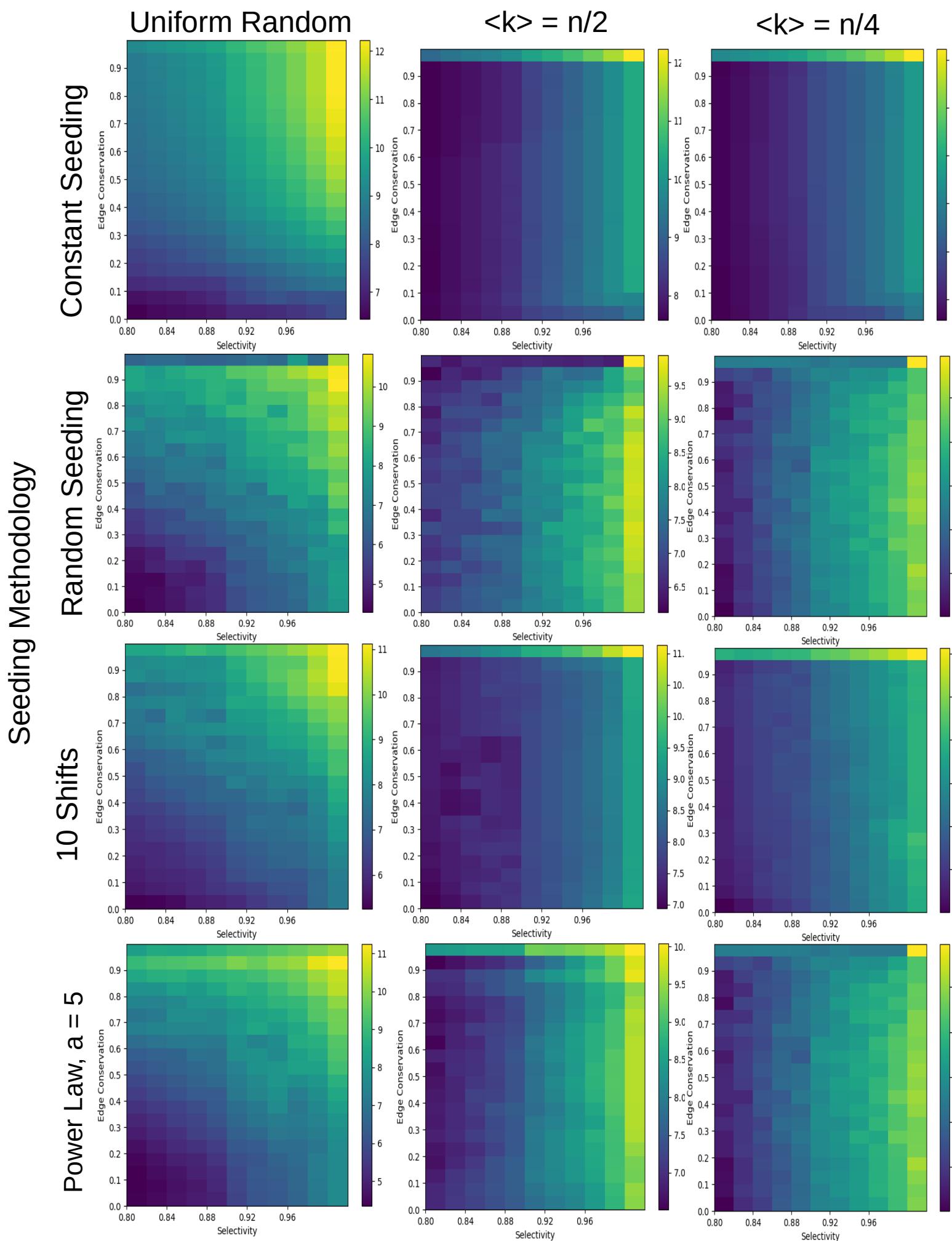
Routing Efficiencies (E_{Routing})



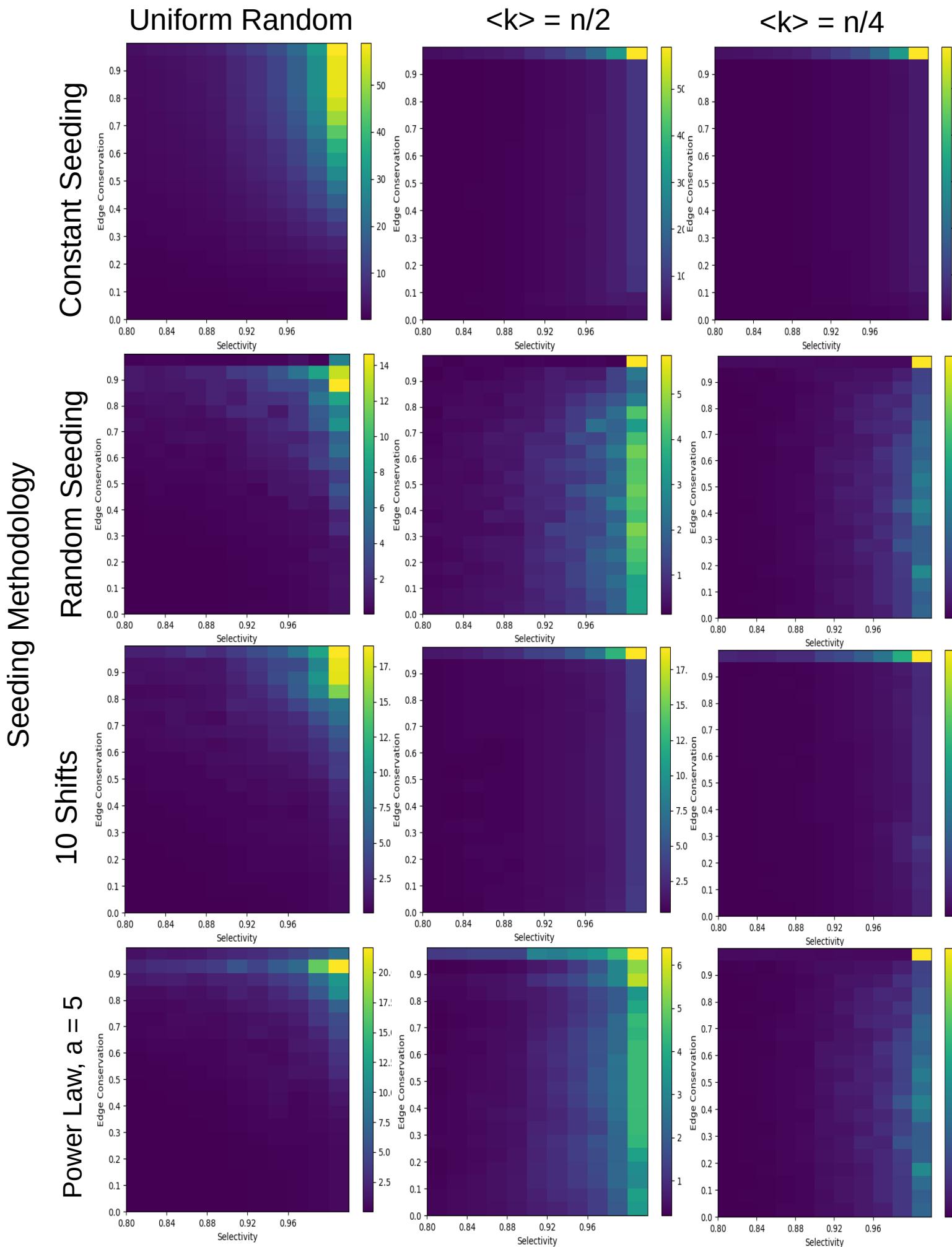
Log Routing Efficiencies (E_{Routing})



Log Average Neighbor Variance Network Structures



Log Average Degree Variance Network Structures



Hierarchy Coordinates

- As Initially developed in:
Hierarchy in complex networks: the possible and the actual [Corominas-Murtra et al.]
- Darker color points indicate higher selectivity/edge conservation values
- Adapted to weighted graphs by averaging over unweighted versions determined via exponentially or linearly distributed thresholds

Efficiency Morphospaces

- From Exploring the Morphospace of Communication Efficiency in Complex Networks [Goni et al. 2013]
- Adapted from unweighted to weighted graphs

Hierarchy Coordinates Linear Thresholds, Colored by Selectivity

Uniform Random

$\langle k \rangle = n/2$

$\langle k \rangle = n/4$

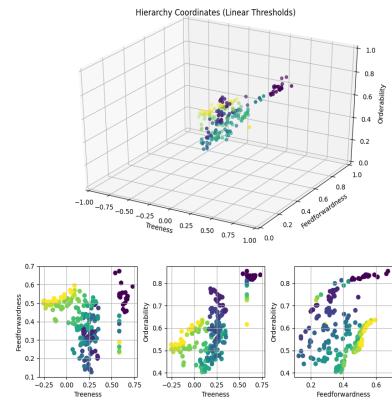
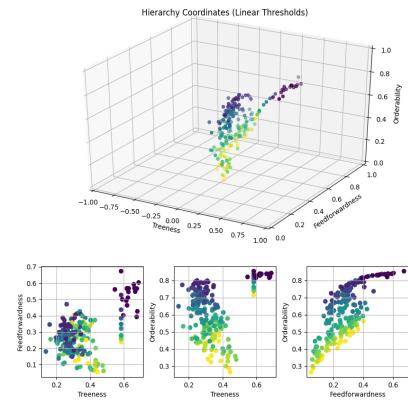
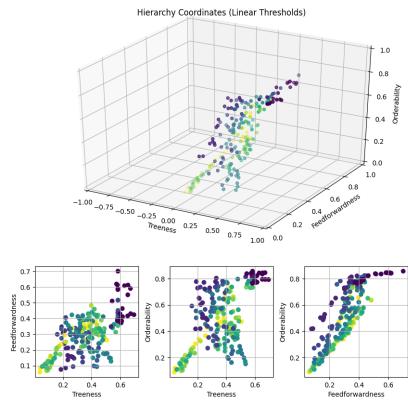
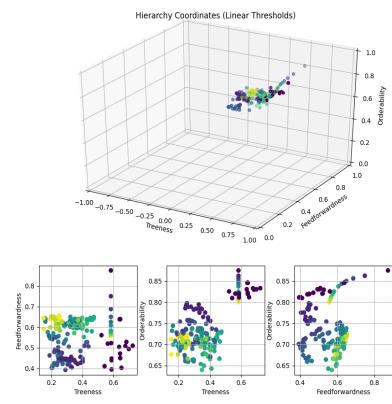
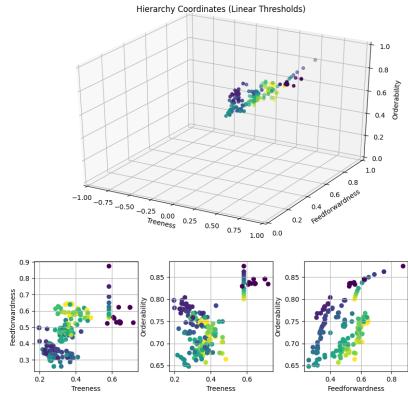
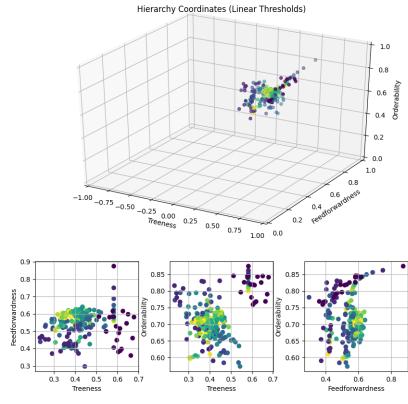
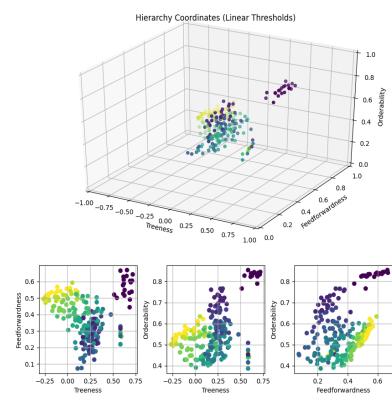
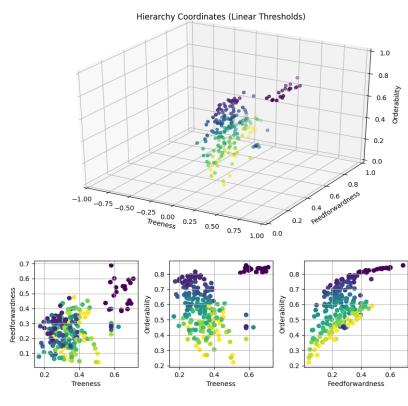
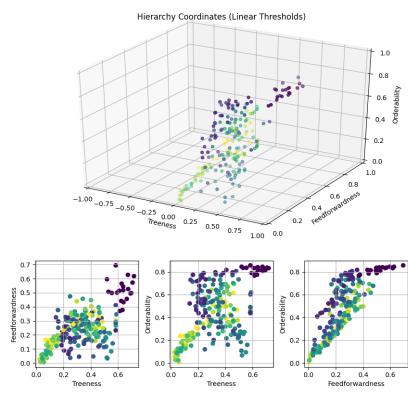
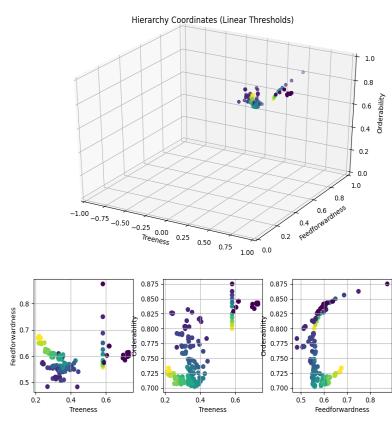
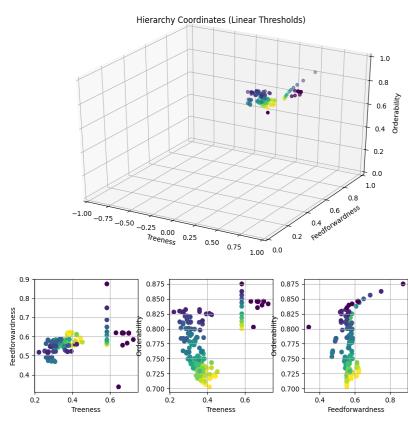
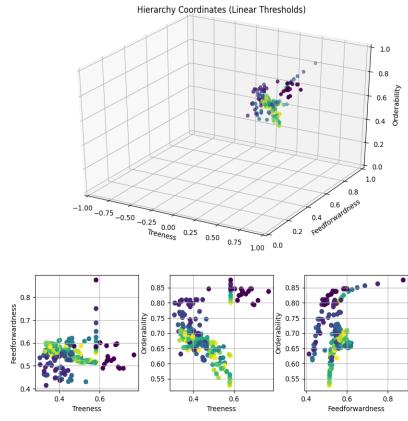
Seeding Methodology

10 Shifts

Power Law, $\alpha = 5$

Random Seeding

Constant Seeding



Hierarchy Coordinates Linear Thresholds, Colored by Edge Conservation

Uniform Random

$\langle k \rangle = n/2$

$\langle k \rangle = n/4$

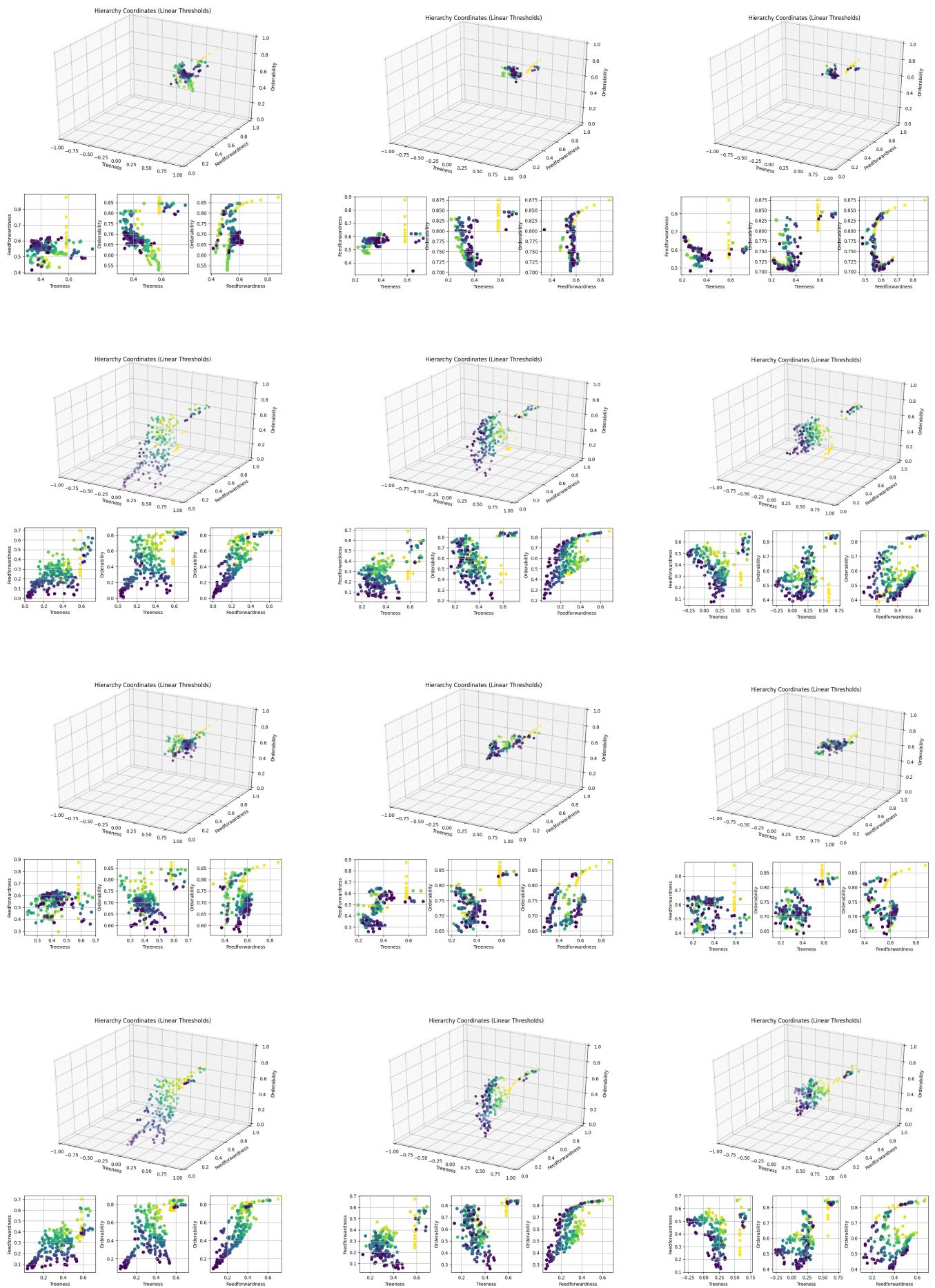
Seeding Methodology

10 Shifts

Constant Seeding

Random Seeding

Power Law, $\alpha = 5$



Hierarchy Coordinates

Exponential Thresholds, Colored by Selectivity

Uniform Random

$$\langle k \rangle = n/2$$

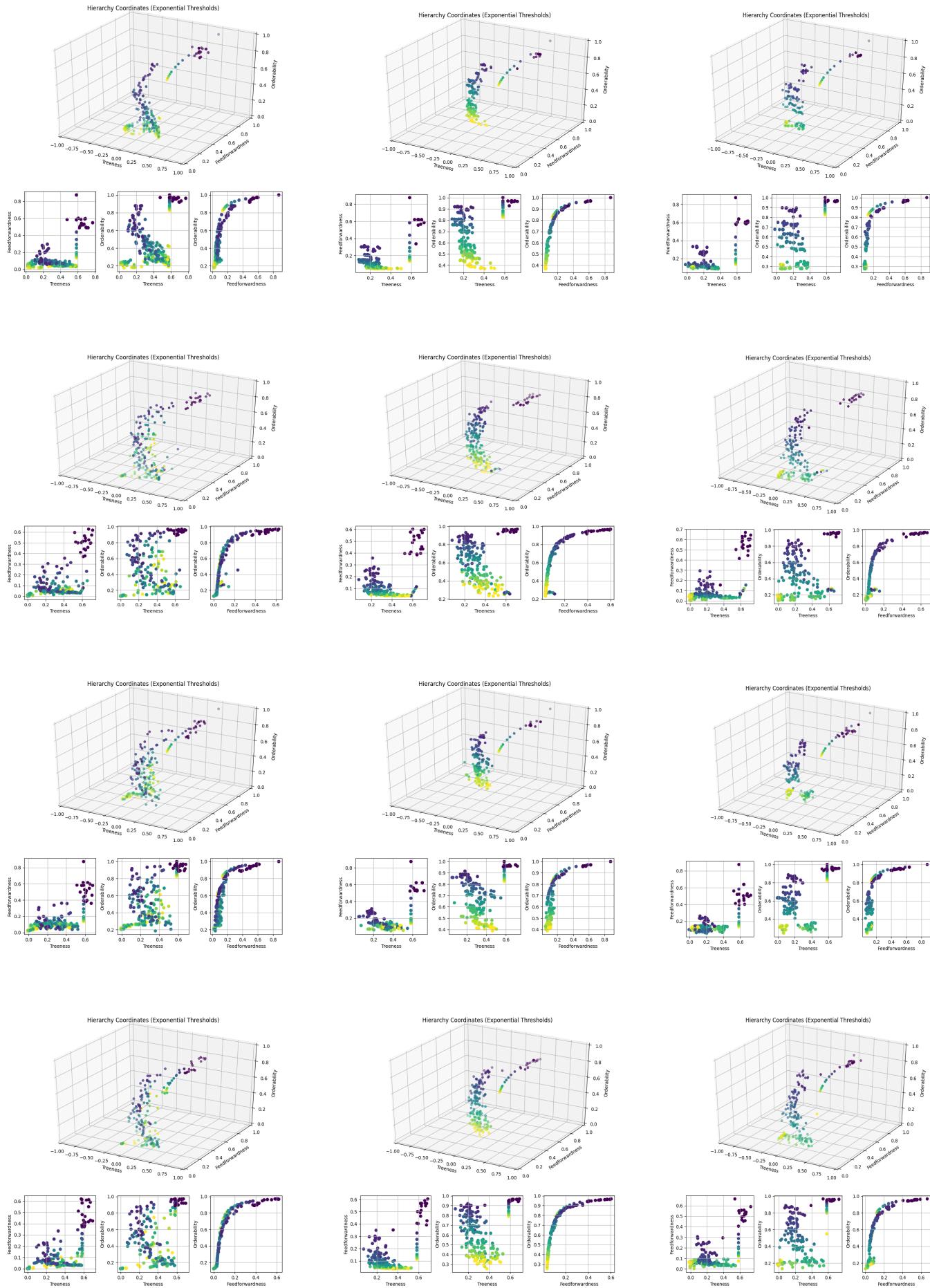
$$\langle k \rangle = n/4$$

Constant Seeding

Seeding Methodology

10 Shifts

Power Law, $\alpha = 5$



Hierarchy Coordinates

Exponential Thresholds, Colored by Edge Conservation

Uniform Random

$\langle k \rangle = n/2$

$\langle k \rangle = n/4$

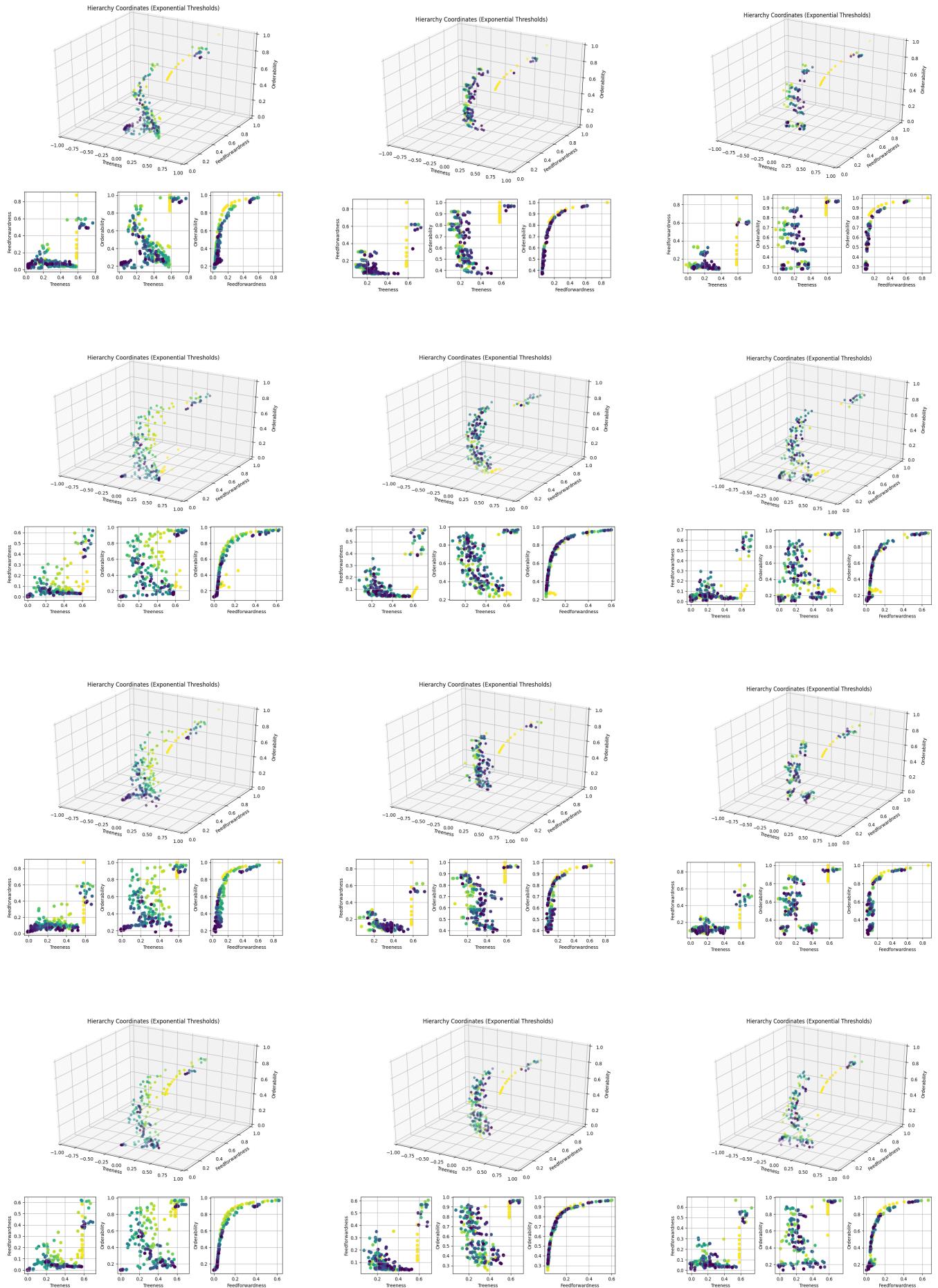
Seeding Methodology

10 Shifts

Constant Seeding

Random Seeding

Power Law, $\alpha = 5$



Efficiency Coordinates

Complete Efficiency Morphospace Colored By Selectivity

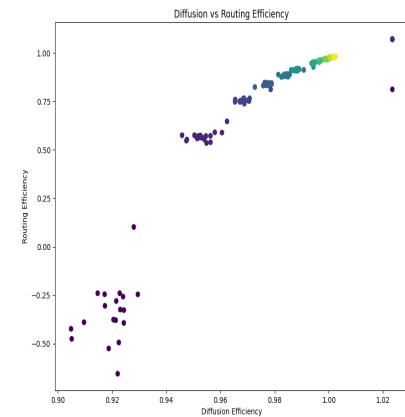
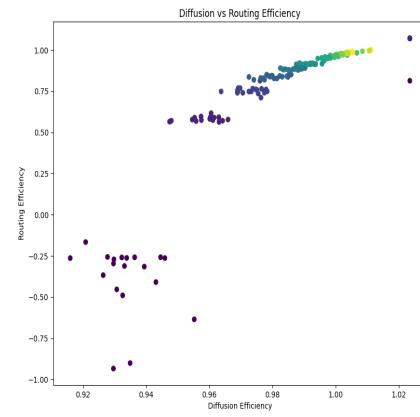
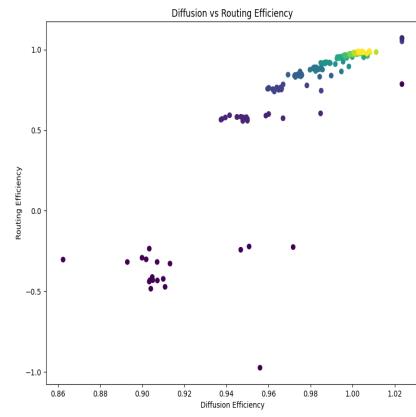
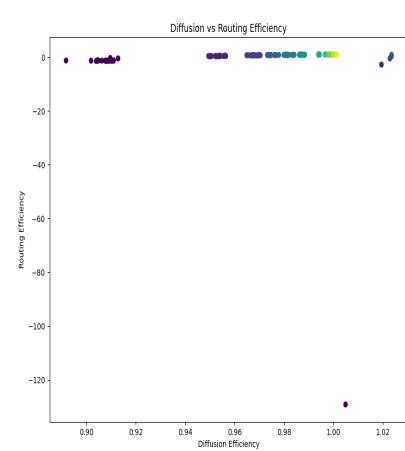
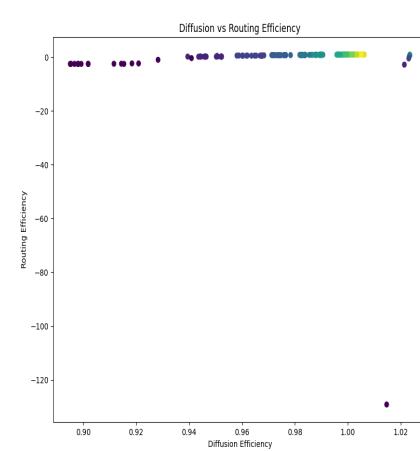
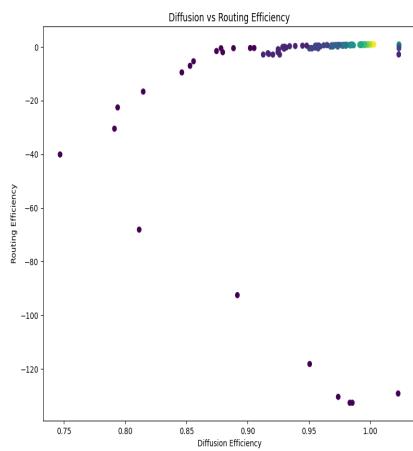
Uniform Random

$\langle k \rangle = n/2$

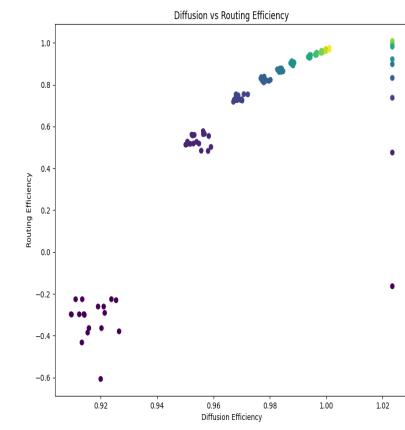
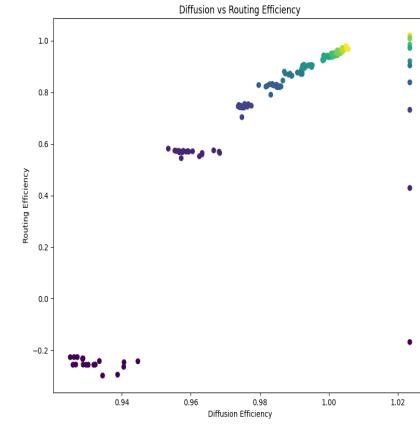
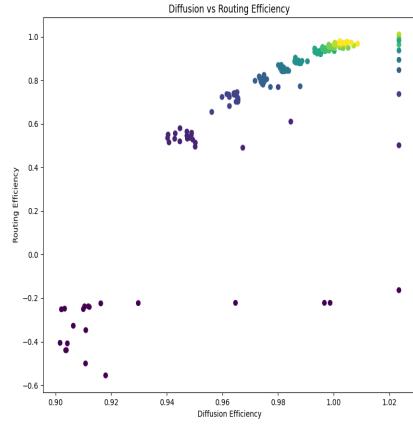
$\langle k \rangle = n/4$

Seeding Methodology

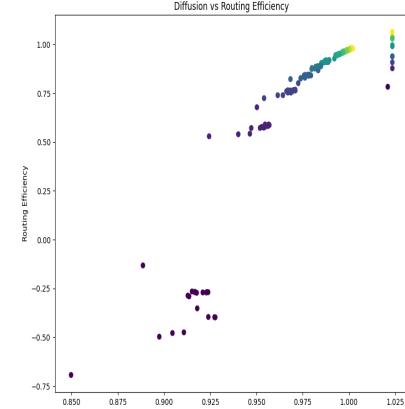
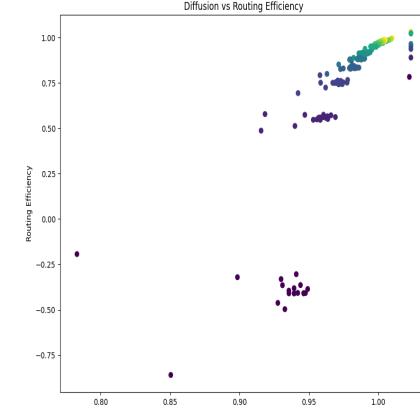
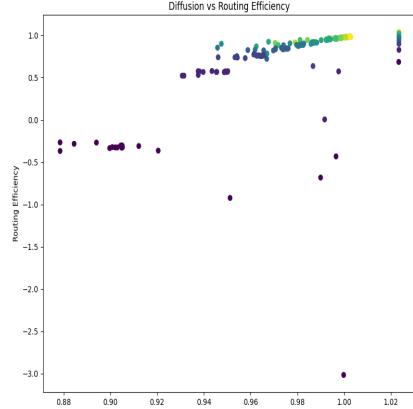
Constant Seeding



10 Shifts



Power Law, $\alpha = 5$



Efficiency Morphospace (Around 1, 1) Colored By Selectivity

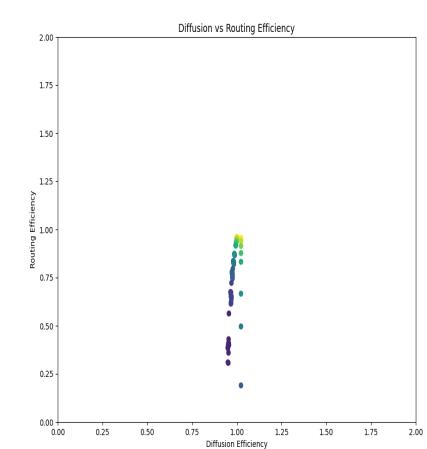
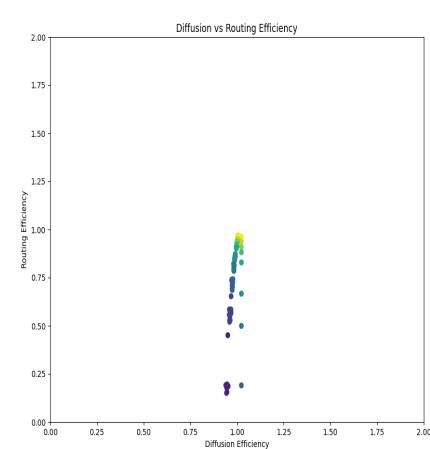
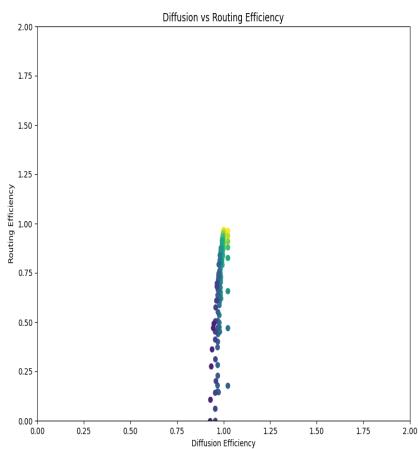
Uniform Random

$\langle k \rangle = n/2$

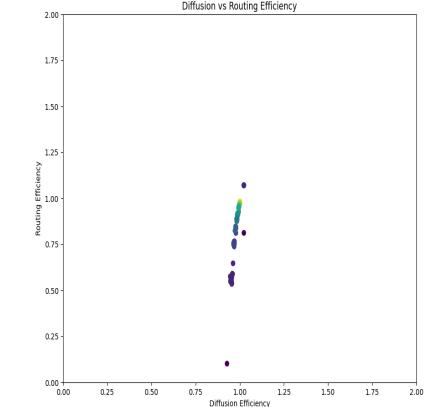
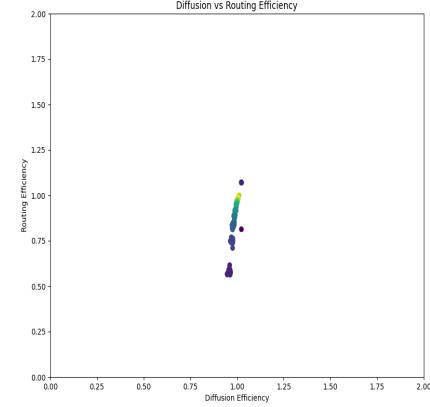
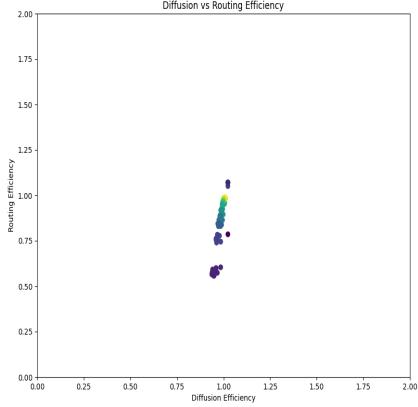
$\langle k \rangle = n/4$

Seeding Methodology

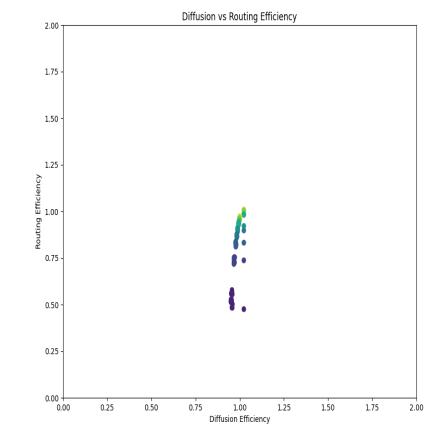
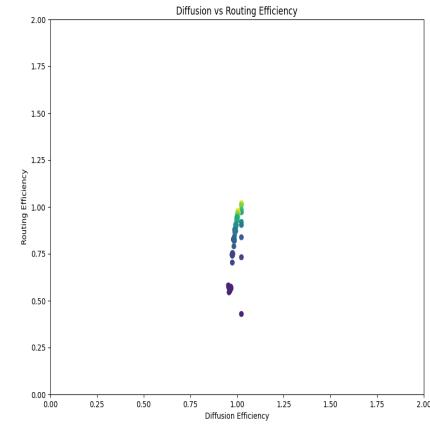
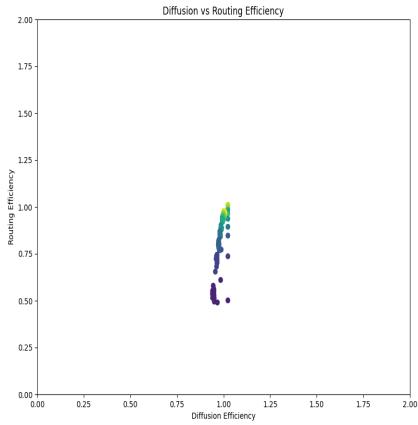
Constant Seeding



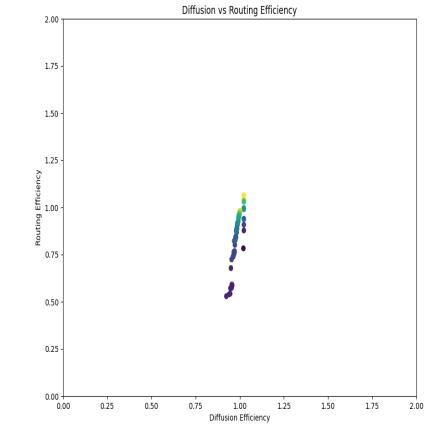
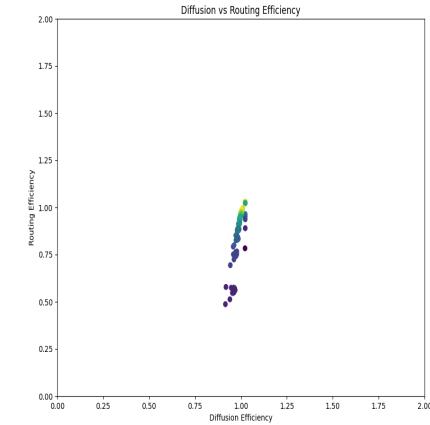
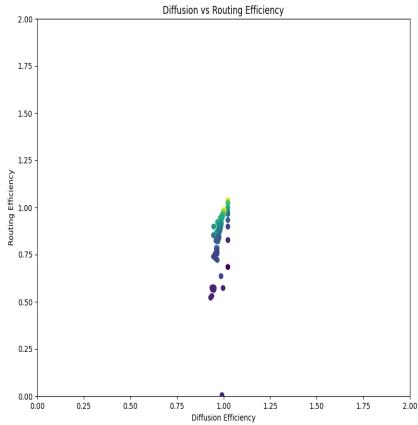
Random Seeding



10 Shifts



Power Law, $\alpha = 5$



Efficiency Morphospace (outliers minimized; variable space)

Colored Via Selectivity

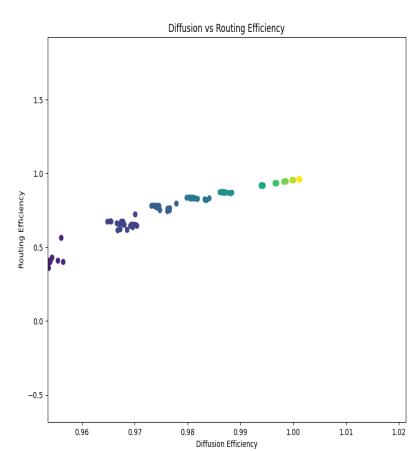
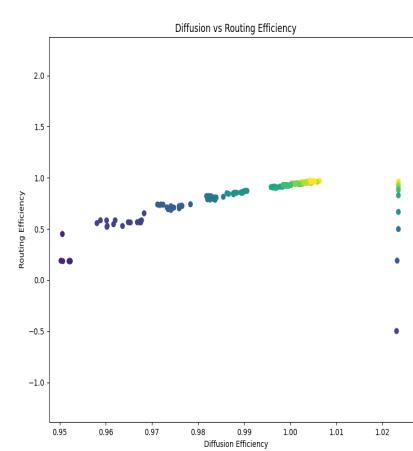
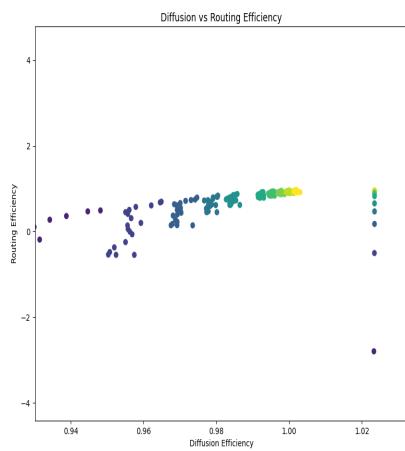
Uniform Random

$\langle k \rangle = n/2$

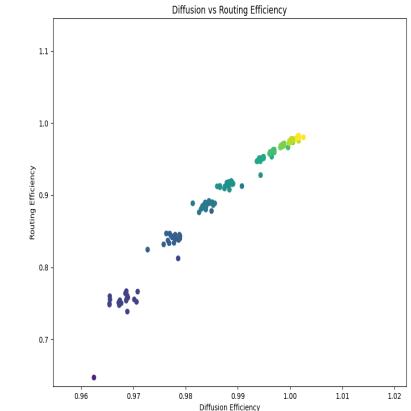
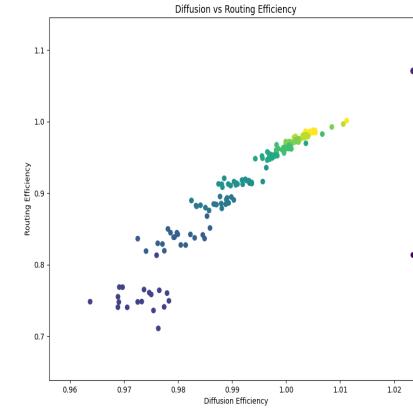
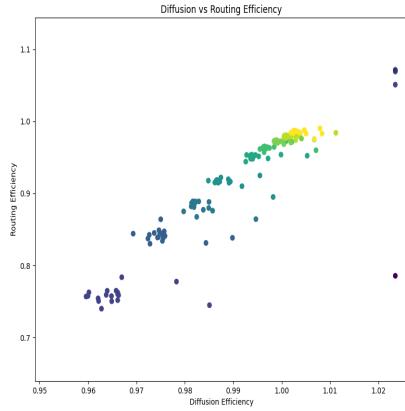
$\langle k \rangle = n/4$

Seeding Methodology

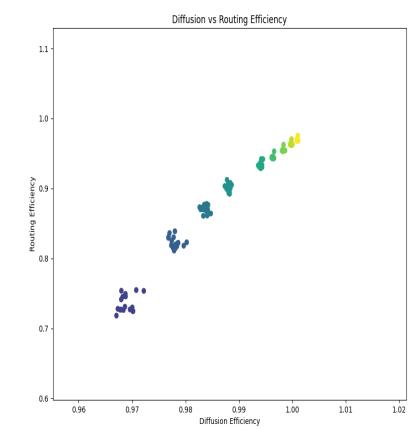
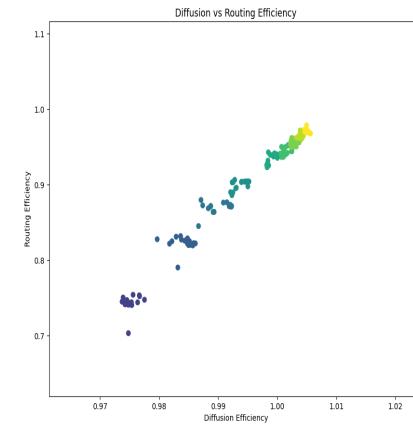
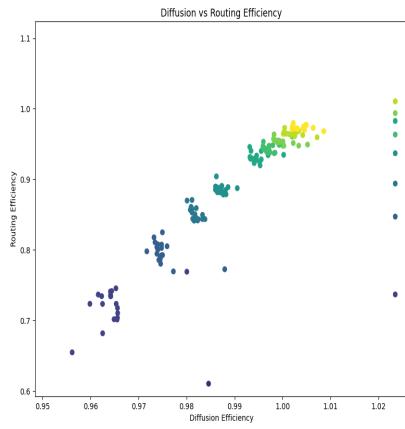
Constant Seeding



Random Seeding



10 Shifts



Power Law, $\alpha = 5$

