Supplemental Material

Non-Identical Multiplexing promotes chimera states
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Figure 1: (Color online) Map of regimes for a mismatched 1D-1D multiplex network. The normalized correlation measure $g_0$, calculated for layer 2, is plotted in the parameter plane ($\langle k^1 \rangle$, $\varepsilon$), where $\langle k^1 \rangle$ represents the node degree of the first layer and $\varepsilon$ is the coupling strength. The second layer of this multiplex network has the node degree $\langle k^2 \rangle = 64$. Intermediate values of $g_0$ between 0 and 1 correspond to chimera states. Note in particular the chimera tongue around $\langle k^1 \rangle = 64$. Parameters: network size $N^1 = N^2 = 100$, $\delta = 0.01(max(|D|))$; $g_0$ is averaged over 1000 time steps.
Figure 2: Chimera state in the first layer of a multiplex network consisting of regular lattice in both layers: (a) snapshot $z_i(t)$, (b) snapshot $d_i(t)$ where $d_i$ is the Laplacian distance measure. Other Network parameters: $N^1 = N^2 = 100$, $k^1 = k^2 = 64$, $\varepsilon = 0.32$, $\mu = 4.0$, $\delta = 0.0384$.

Figure 3: A realization of an initial condition which is taken from a uniform random distribution multiplied by a Gaussian profile. The Gaussian is of the form $z_i(t = 0) = exp[-30(\frac{i}{N} - \frac{1}{2})]$. Network size $N = 100$. 
Figure 4: (Color online) Map of regimes for (a) regular - Erdős-Rényi (ER) (b) regular - scalefree (SF) multiplex network. The normalized correlation measure $g_0$, calculated for layer 1, is plotted in the parameter plane ($\langle k^2 \rangle, \varepsilon$), where $\langle k^2 \rangle$ represents the node degree of the second layer [(a) Erdős-Rényi (ER) network, (b) scalefree (SF) network] and $\varepsilon$ is the coupling strength. The first layer consists of a regular network and has the node degree $\langle k^1 \rangle = 64$. Intermediate values of $g_0$ between 0 and 1 indicate chimera states. Parameters: network size $N^1 = N^2 = 100$, $\delta = 0.01(max(|D|))$, $g_0$ is averaged over 1000 time steps.