mark the area of convergence to z^*, gray tones mark Julia set. The darker color, the faster escape to infinity.

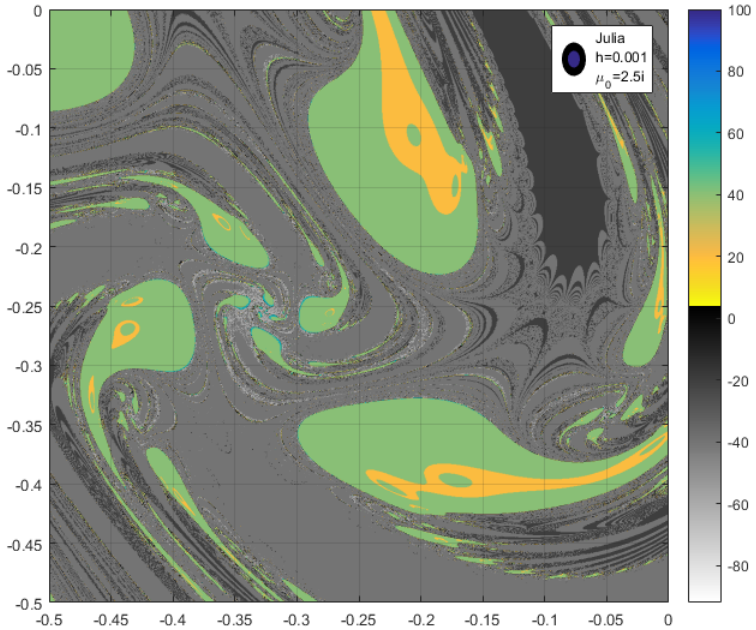

Figure 2: The common structure of Julia and Fatou sets for a solitary map with $\mu_0 = 2.5i$. As in Figure 1, the axes represent the real and imaginary parts of the initial condition. Color indicates the number of iterations to convergence, gray tones indicate the number of iterations before leaving orbit to infinity.

Synchronization Phenomena in Rings of Coupled Three van der Pol Oscillators

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Synchronization phenomena have been studied in various fields since a long time ago, such as in electrical systems, in mechanical systems, in biological systems and basically everywhere. Among them, synchronization phenomena of van der Pol oscillator are similar to natural phenomena by changing frequency. The coupled system of van der Pol oscillators is simple and easy to handle. Many researchers have proposed various coupled oscillatory networks of van der Pol oscillators [1] - [2]. We focus on the coupling strength of coupled oscillatory networks consisted of two kinds of oscillators including van der Pol oscillator.

In this study, we propose a novel coupled oscillatory system. Figure 1 shows circuits of van der Pol oscillators. Figure 2 shows the circuit model. We use two ring circuits with six oscillators. Three VDP of the first ring are connected by resistors, three NC of the second ring are connected by inductors and resistors. The first and the second ring are connected by resistors (R_1, R_2, R_3). We investigate how to change synchronization phenomena of adjacent oscillators by changing the value of R_1, R_2 and R_3 by computer simulations and circuit experiments. Furthermore, when we change only the value of R_2 from 0 to 0.03 at intervals of 0.001, we investigate relationship between coupling strength and phase difference. This research obtained an interesting results which synchronization phenomena are observed by magnitude correlation between R_1, R_2 and R_3.

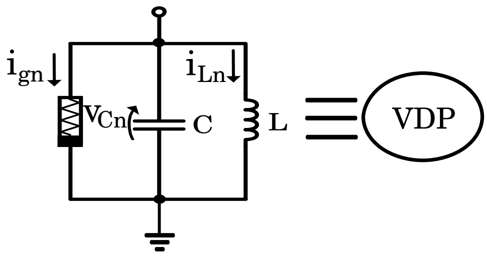

Figure 1: Circuit of van der Pol oscillators.

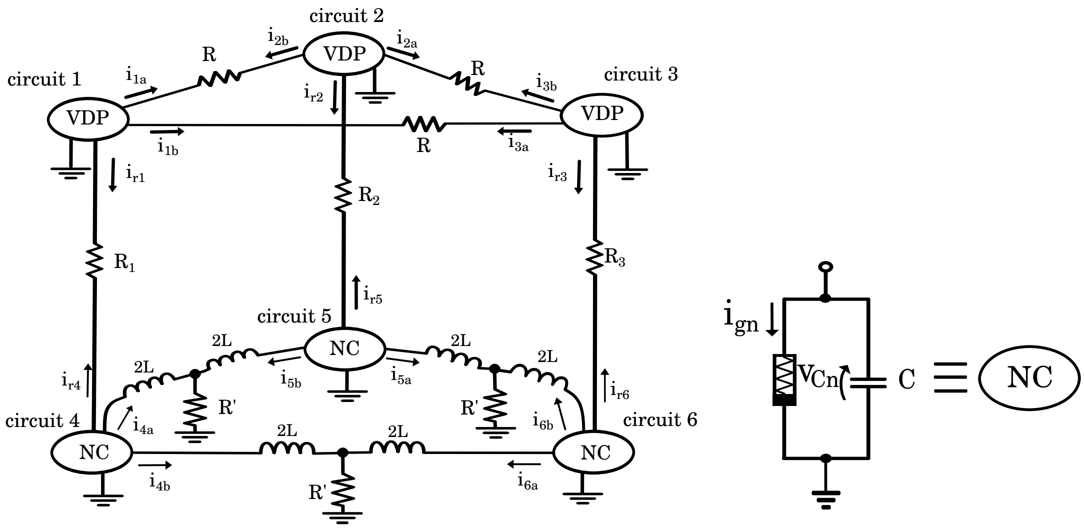

Figure 2: Circuit model.

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On the shadowing property and odometers

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When we investigate the space of invariant measures from ergodic theory point of view, we are usually not that much interested in the topological structure of underlying space. By famous Jewett-Krieger theorem, we can view invariant measures as supported on minimal systems and numerous further generalizations allow to add even more topological (dynamical) properties to the underlying system. On the other hand, there are examples of systems with quite rich dynamical structure (e.g. topologically mixing) but not that much interesting invariant measures (e.g. only trivial measure, only atomic