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**Kelsey Butera\*** (buterak2@hawkmail.newpaltz.edu) and **Anca Radulescu**  
(radulesa@newpaltz.edu). *Template iterations of quadratic maps and hybrid Mandelbrot sets.*

As a particular problem within the field of non-autonomous discrete systems, we consider iterations of two quadratic maps  $f_{c_0} = z^2 + c_0$  and  $f_{c_1} = z^2 + c_1$ , according to a prescribed binary sequence, which we call *template*. We study the asymptotic behavior of the critical orbits, and define the Mandelbrot set in this case as the locus for which these orbits are bounded. Unlike in the case of single maps, this concept can be understood in several ways. For a fixed template, one may consider this locus as a subset of the parameter space in  $\mathbb{C}^2$ ; for fixed quadratic parameters, one may consider the set of templates which produce bounded critical orbits. We consider both situations, as well as *hybrid* combinations of them, and we investigate basic topological properties of these sets.

We use this framework to study the effect of errors in copying mechanisms (such as DNA replication). Viewing one of the functions as the correct one, and the other as an erroneous perturbation – we consider problems that a sustainable replication system may have to solve when facing the potential for errors. We find that it is possible to tell which specific errors are more likely to affect the system’s dynamics, in absence of prior knowledge of their timing. (Received September 23, 2017)