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Gregory R Baker* (baker@math.ohio-state.edu), Dept Mathematics, Ohio State University, 231 W 18th Ave, Columbus, OH 43210, and **Chao Xie**. *Singularities in the complex plane for deep water waves.*

Water waves are perhaps the most notable feature of the planet, and they have occupied the attention of scientists since the birth of civilization. Yet they remain incompletely understood. Despite recent theoretical advances, the generic mathematical behavior of water waves eludes description. I will present a different view of water waves traveling in two-dimensions, a view based on the relationship between the curvature and the arclength. The curvature has simple poles in the complex arclength plane that travel about while retaining their form. They can approach closely to the real axis during wave breaking and are associated with the tip of the plunging breaker. A different view of wave breaking is the presence of a square-root singularity in the surface height as a function of the horizontal coordinate that reaches the real axis in finite time when the slope becomes vertical. Even in the absence of wave breaking, these singularities are present and strongly affect the wave spectra. (Received September 21, 2011)