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Dynamic topological logic of the real line.

This talk explores the topological interpretations of the modal language with two modalities – \Box , which is interpreted as the interior operation and \circ (“next”) which is interpreted as the preimage operation for a continuous function. It is known that the $\Box\circ$ logic **S4C** introduced by Artemov, Davoren and Nerode is complete with respect to topological interpretations in \mathbb{R}^n for $n \geq 2$, but it is incomplete with respect to topological interpretations in \mathbb{R} . We therefore focus on the logic $L_{\Box\circ}(\mathbb{R})$ of all the $\Box\circ$ formulas that are sound with respect to topological interpretations in \mathbb{R} .

In this talk we present two axioms - **R-1** and **R-2** in $L_{\Box\circ}(\mathbb{R}) - \mathbf{S4C}$, and prove that they are sound in \mathbb{R} . We also demonstrate that any Kripke frame that satisfies **S4C** + **R-2** will also satisfy a specific formula **NR**, where **NR** $\notin L_{\Box\circ}(\mathbb{R})$. It follows that $L_{\Box\circ}(\mathbb{R})$ cannot be complete with respect to any class of Kripke frames. (Received January 15, 2008)