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"Shift invariant subspaces of large index in the Bloch space"

We construct invariant subspaces of the Shift operator M_z, defined on the Bloch space $\mathcal{B}$ and the little Bloch space $\mathcal{B}_0$. The index of an invariant subspace E is defined as $\operatorname{ind}(E) := \dim(E/zE)$. We construct closed, shift invariant subspaces in the Bloch space that can have index as large as the cardinality of the unit interval $[0, 1]$. Next we provide two different constructions of closed, shift invariant subspaces in the little Bloch space that have arbitrary large, but countable, index.