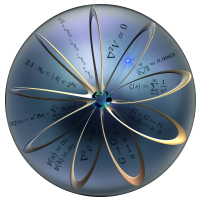

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Schauder lemma

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The following theorem is in the functional analysis literature generally referred to as the *Schauder lemma*. It is a version of the open mapping theorem in Fréchet spaces and is often used to verify the open-ness of linear, continuous maps.

Theorem. Let E, F be Fréchet spaces. Denote by $\mathcal{U}_0(E), \mathcal{U}_0(F)$ the zero neighborhood filter of E and F respectively. Let $T\colon E \to F$ be a linear and continuous map which is *almost open*, i.e.

$$\forall_{U \in \mathscr{U}_0(E)} \overline{T(U)}^F \in \mathscr{U}_0(F)$$

Then T is open.