

## Re: Are closed operators maximal?

---

*Source:* <http://sci.tech-archive.net/Archive/sci.math/2007-07/msg02451.html>

---

- *From:* rusty <[mr.rusty@xxxxxxx](mailto:mr.rusty@xxxxxxx)>
  - *Date:* Mon, 16 Jul 2007 10:02:18 +0200
- 

fjblurt@xxxxxxxxxx wrote:

Hi everyone,

I'm studying unbounded operators, and I'm trying to check my intuition on something. I have this idea that the closure of an operator is in some sense a maximal extension. That is, suppose  $X$  is a Banach space,  $A$  is a closed densely defined operator, and  $B$  a closed extension of  $A$ . Must  $A = B$ ? I can't prove it, but I don't know of too many things to try as counterexamples either.

Thanks in advance for any tips.

In a Hilbert space, you can take the Friedrichs extension  $B$  and the von Neumann–Krein extensions  $C$  of a positive symmetric densely defined operator  $A$ . Both are (densely defined) self-adjoint operators and any other self-adjoint extension  $D$  of  $A$  satisfies  $B \leq D \leq C$ . For a discussion with examples and references please see:

[http://en.wikipedia.org/wiki/Extensions\\_of\\_symmetric\\_operators](http://en.wikipedia.org/wiki/Extensions_of_symmetric_operators)

[http://en.wikipedia.org/wiki/Friedrichs\\_extension](http://en.wikipedia.org/wiki/Friedrichs_extension)

--

rusty

.