



Mathematics > Functional Analysis

# Heat equation for weighted Banach space valued function spaces

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(Submitted on 5 Jun 2012)

We study the homogeneous equation (\*)  $u' = \Delta u$ ,  $t > 0$ ,  $u(0) = f$  in  $wX$ , where  $wX$  is a weighted Banach space,  $w(x) = (1 + ||x||)^k$ ,  $x \in \mathbb{R}^n$  with  $k \geq 0$ ,  $\Delta$  is the Laplacian,  $Y$  a complex Banach space and  $X$  one of the spaces  $BUC(\mathbb{R}^n, Y)$ ,  $C_0(\mathbb{R}^n, Y)$ ,  $L^p(\mathbb{R}^n, Y)$ ,  $1 \leq p < \infty$ . It is shown that the mild solutions of (\*) are still given by the classical Gauss-Poisson formula, a holomorphic  $C_0$ -semigroup.

Subjects: **Functional Analysis (math.FA)**

Cite as: **arXiv:1206.0810 [math.FA]**

(or **arXiv:1206.0810v1 [math.FA]** for this version)

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