We consider a linear system of PDEs of the form

\[
\begin{align*}
  u_{tt} - c\Delta u_t - \Delta u &= 0 \text{ in } \Omega \times (0, T) \\
  u_{tt} + \partial_n (u + cu_t) - \Delta_{\Gamma}(\alpha u_t + u) &= 0 \text{ on } \Gamma_1 \times (0, T) \\
  u &= 0 \text{ on } \Gamma_0 \times (0, T)
\end{align*}
\]

(1)

on a bounded domain \( \Omega \) with boundary \( \Gamma = \Gamma_1 \cup \Gamma_0 \). We show that the system generates a strongly continuous semigroup \( T(t) \) which is analytic for \( \alpha > 0 \) and of Gevrey class for \( \alpha = 0 \). In both cases the flow exhibits a regularizing effect on the data. In particular, we prove quantitative time-smoothing estimates of the form \( \|(d/dt)T(t)\| \leq |t|^{-1} \) for \( \alpha > 0 \), \( \|(d/dt)T(t)\| \leq |t|^{-2} \) for \( \alpha = 0 \). The argument is based on microlocalization in the boundary collar. Moreover, when \( \alpha = 0 \) we prove a novel result which shows that these estimates hold under relatively bounded perturbations up to 1/2 power of the generator. (Received January 28, 2014)