1033-35-171 **Gieri Simonett*** (gieri.simonett@vanderbilt.edu), Vanderbilt University, Department of Mathematics, Nashville, TN 37240, and **Jan Pruss**. *On the Stefan problem with surface tension.*

The Stefan problem is a model for phase transitions in solid-liquid systems. In this paper, we consider the two-phase Stefan problem with the modified Gibbs-Thomson law

$$u = \sigma H + \delta V \quad \text{on} \;\; \Gamma(t), \quad \sigma > 0,\; \delta \geq 0, \tag{1}$$

and the kinetic condition

$$[d\partial_\nu u] = (\ell - [\kappa]u)V \quad \text{on} \quad \Gamma(t). \tag{2}$$

Here $\Gamma(t)$ denotes the unknown moving hypersurface that separates the liquid from the solid phase, u is the temperature, H the mean curvature of $\Gamma(t)$, σ the surface tension coefficient, δ the coefficient of kinetic undercooling, V the normal velocity of $\Gamma(t)$, ℓ the latent heat, $[\kappa]$ the jump of the heat capacities across $\Gamma(t)$, and $[d\partial_\nu u]$ the jump of the heat fluxes across $\Gamma(t)$.

Under appropriate boundary conditions we will show that spheres (together with constant temperature distributions) are the only equilbrium states for this system, and we will characterize the stability of these equilibria in dependence of physical and geometric quantities. (Received September 10, 2007)