1077-35-1081   **Chunquan Tang***, ctang@iastate.edu, and **Gary M Lieberman**. *Mixed Boundary Value Problem for Quasilinear Elliptic Equations.* Preliminary report.

The gradient bound of a nonlinear mixed boundary-value problem for a class of equations in the domains with boundary curvature conditions is studied. A particular case of it is the following capillary problem:

$$\text{div}\Big(\frac{Du}{\sqrt{1+|Du|^2}}\Big) = 0, \qquad\qquad\qquad \text{in } \Omega,$$

$$u = \psi(x), \qquad\qquad\qquad \text{on } \partial_1\Omega,$$

$$\frac{Du}{\sqrt{1+|Du|^2}} \cdot \gamma(x) = \cos\beta, \qquad\qquad\qquad \text{on } \partial_2\Omega.$$

Here $\gamma(x)$ is the unit inner normal vector on the boundary $\partial_2\Omega$. Suppose θ is any one of angles formed by $\partial_1\Omega$ and $\partial_2\Omega$. It is shown that, among other conditions, when $\theta < \frac{\pi}{2} - |\frac{\pi}{2} - \beta|$, a global gradient bound exists. (Received September 16, 2011)

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