1020-35-45 **Wenxiong Chen** (wchen@ymail.yu.edu), Department of Mathematics, Yeshiva University, New York, NY 10033, **Congming Li** (cli@colorado.edu), Department of Applied Mathematics, University of Colorado at Boulder, Boulder, CO 80309, and **Biao Ou*** (bou@math.utoledo.edu), Department of Mathematics, University of Toledo, Toledo, OH 43606. *Alternative proofs on the radial symmetry and monotonicity for positive regular solutions to a singular integral equation.*

Let n be a positive integer and let α satisfy $0 < \alpha < n$. Consider a positive regular solution $u(x)$ to the integral equation

$$u(x) = \int_{R^n} \frac{1}{|x-y|^{n-\alpha}} u(y)^{(n+\alpha)/(n-\alpha)} dy.$$

In previous papers we have used the method of moving planes to prove that for every direction $u(x)$ is symmetric about a plane perpendicular to the direction and that $u(x)$ is monotone on the two sides of the plane. It follows that $u(x)$ is radially symmetric about a point and is a strictly decreasing function of the radius. It then follows that $u(x)$ must be a constant multiple of a function of form

$$\left(\frac{t}{t^2 + |x-x_0|^2}\right)^{(n-\alpha)/2}$$

where $t > 0$ and $x_0 \in R^n$. Here we supply alternative proofs on the result and provide further remarks. (Received August 05, 2006)