1116-35-750 **W. Y. Chan***, Department of Mathematical Sciences, Montana Tech, Butte, MT 59701. *Finding the Critical Domain for Quenching Problems Using Conformal Mappings.*

Let Ω_1 and Ω_2 be square-shaped domains such that $\Omega_1 \subset \Omega_2$. We will determine the approximated critical domain of the problem (1)-(2) below by using a conformal mappping,

$$\left.\begin{aligned} \frac{\partial u}{\partial \theta} &= \frac{\partial^2 u}{\partial \chi^2} + \frac{\partial^2 u}{\partial \zeta^2} + \frac{1}{1-v} \text{ in } \Omega_1 \times (0,\infty)\,, \\ \frac{\partial v}{\partial \theta} &= \frac{\partial^2 v}{\partial \chi^2} + \frac{\partial^2 v}{\partial \zeta^2} + \frac{1}{1-u} \text{ in } \Omega_2 \times (0,\infty)\,, \end{aligned}\right\} \tag{1}$$

$$\left.\begin{aligned} u\left(\chi,\zeta,0\right) = 0 \text{ for } \left(\chi,\zeta\right) \in \Omega_1 \text{ and } v\left(\chi,\zeta,0\right) = 0 \text{ for } \left(\chi,\zeta\right) \in \Omega_2, \\ u\left(\chi,\zeta,\theta\right) = 0 \text{ for } \theta > 0 \text{ and } \left(\chi,\zeta\right) \in \partial\Omega_1 \text{ and } v\left(\chi,\zeta,\theta\right) = 0 \text{ for } \theta > 0 \text{ and } \left(\chi,\zeta\right) \in \partial\Omega_2. \end{aligned}\right\} \tag{2}$$

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