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Working in $\text{ZF} + \text{DC}$. We say that ω_1 is X -supercompact if there is a normal fine measure on $\mathcal{P}_{\omega_1}(X)$. We let Θ be the supremum of α such that there is a surjection from \mathbb{R} onto α . We briefly sketch the proof of the following theorem:

$\text{ZFC} \vdash \text{Con}(\text{ZF} + \text{DC} + \Theta > \omega_2 + \omega_1 \text{ is } \mathbb{R}\text{-supercompact}) \Leftrightarrow \text{Con}(\text{ZF} + \text{DC} + \text{AD} + \omega_1 \text{ is } \mathbb{R}\text{-supercompact}).$

Canonical models of the above theories are of the form $L(\mathbb{R}, \mu)$ for some normal fine filter μ on $\mathcal{P}_{\omega_1}(\mathbb{R})$. We also discuss some applications of the structure theory of such models and some related open problems. (Received August 03, 2013)