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**Roger A. Nichols\*** (rnich\_35180@yahoo.com), 1300 University Boulevard, Campbell Hall, Suite 452, Birmingham, AL 35294. *Spectral Properties of Discrete Displacement Models.*

We consider a discrete displacement model  $h_\omega$  on  $\ell^2(\mathbb{Z}^d)$  indexed by a displacement configuration  $\omega = \{\omega_k\}_{k \in \mathbb{Z}^d}$  and determine a configuration  $\omega^*$  with the property that  $h_{\omega^*}$  has the lowest possible ground and highest possible ceiling state energies. For the random displacement model, i.e. for  $\omega_k$  i.i.d. random vectors, the configuration  $\omega^*$  allows to calculate the minimum and maximum of the almost-sure spectrum. Using this result and positivity properties of generalized eigenfunctions, we show the almost-sure spectrum  $\Sigma_\lambda$  of the one-dimensional Bernoulli displacement model  $h_\omega(\lambda)$ , where  $\lambda \in \mathbb{R} \setminus \{0\}$  is a fixed coupling constant, contains a gap for every  $\lambda \neq 0$ . We explicitly calculate  $\Sigma_\lambda$  for  $0 < |\lambda| \leq 2$ . Consequences for the integrated density of states are also discussed. (Received January 25, 2010)