1163-43-187 **Xuan Thinh Duong,**, Department of Mathematics, Macquarie University, NSW, 2109, Australia, **Ji Li**, Department of Mathematics, Macquarie University, NSW, 2109, Australia, **Eric T Sawyer**, Hamilton, Ontario , Canada, **Naga Manasa Vempati*** (m.vempati@wustl.edu), Department of Mathematics, Washington University, One Brookings Drive, Saint Louis, MO 63130-4809, **Brett D. Wick** (wick@math.wustl.edu), Department of Mathematics, Washington University in Saint Louis, One Brookings drive, Saint Louis, MO 63130-4809, and **Dongyong Dongyong Yang**, Department of Mathematics, Xiamen University, Xiamen, 361005. *A two weight inequality for Calderón-Zygmund operators on spaces of homogeneous type with applications.*

Let (X, d, μ) be a space of homogeneous type in the sense of Coifman and Weiss, i.e. d is a quasi metric on X and μ is a positive measure satisfying the doubling condition. Suppose that u and v are two locally finite positive Borel measures on (X, d, μ). Subject to the pair of weights satisfying a side condition, we characterize the boundedness of a Calderón-Zygmund operator T from $L^2(u)$ to $L^2(v)$ in terms of the A_2 condition and two testing conditions. For every cube $B \subset X$, we have the following testing conditions, with $\mathbf{1}_B$ taken as the indicator of B

$$\|T(u\mathbf{1}_B)\|_{L^2(B,v)} \leq \mathcal{T}\|1_B\|_{L^2(u)},$$

$$\|T^*(v\mathbf{1}_B)\|_{L^2(B,u)} \leq \mathcal{T}\|1_B\|_{L^2(v)}.$$

The proof uses stopping cubes and corona decompositions originating in work of Nazarov, Treil and Volberg, along with the pivotal side condition. (Received August 25, 2020)