

$$\begin{aligned} ||v_i(C^{*}\pi_{Z_i}C')^{\frac{1}{2}}f||^2 &\leq ||v_i(C^{*}\pi_{W_i}C')^{\frac{1}{2}}f||^2 + ||v_i(C^{*}\pi_{W_i}C' - C^{*}\pi_{Z_i}C')^{\frac{1}{2}}f||^2 \\ &\leq (B + \epsilon^2)||f||^2 \end{aligned}$$