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The origin of the $22\ \mu\text{m}$ broad feature and its association with the molecular clouds of the Great Nebula in Carina.

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With the ISO/SWS observations, Chan and Onaka (2000) have identified a broad (width $\sim 10\ \mu\text{m}$) emission feature with unknown carrier(s) at $22\ \mu\text{m}$ in the Great Nebula of Carina. This feature resembles what has been observed in Cas A and may relate to the dust grains formed in supernova ejecta. In order to investigate the physical conditions of the region, where the $22\ \mu\text{m}$ has been detected, we observe the CO and ^{13}CO gas in a wide range of excitation states (from $J = 4 - 3$ to $J = 13 - 12$), spatially-resolved down to $\sim 0.5\ \text{pc}$, in the Great Nebula of Carina. The observation was performed in an area of $2' \times 7'$ ($2\ \text{pc} \times 7\ \text{pc}$) near the young ($< 1\ \text{Myr}$) open star cluster, Trumpler 14, by the *Herschel* Space Observatory.

We compare the spatial variation of this feature with the physical properties of molecular gas, indicated by the CO and ^{13}CO , and of the photo-dissociation region, indicated by [O I] 63 and $145\ \mu\text{m}$, [O III] $88\ \mu\text{m}$, and [C II] $158\ \mu\text{m}$. We also investigate the spectral energy distribution (SED) of dust and compare its variation within the observed region. Based on the comparison, we discuss the possible origin(s) of the $22\ \mu\text{m}$ feature and its association with the interstellar environments.