Malonaldehyde (C$_3$O$_2$H$_4$) is a prototype molecule for the study of intramolecular tunnelling proton transfer. In the case of malonaldehyde, this transfer occurs between the two terminal oxygen atoms in its open-ring structure. Although the ground state tunnelling splitting of 21 cm$^{-1}$ has been accurately determined from microwave studies\textsuperscript{a}, the splitting has never been obtained with high resolution in any excited vibrational state. The $\nu_6$ vibrational band was investigated in a diode laser jet experiment\textsuperscript{b} in 2004, but the researchers were not able to identify the (-) parity tunnelling component and so could not determine the splitting. We have collected high-resolution far-IR Fourier transform spectra from a number of fundamental vibrational bands of malonaldehyde at the CLS (Canadian Light Source) synchrotron in Saskatoon, Saskatchewan, exploiting the considerable gain in signal-to-noise ratio at the highest resolution available afforded by the intense and well-collimated beam. We will report on our tunnelling-rotation analysis of the anti-symmetric out-of-plane bend near 384 cm$^{-1}$ and present its tunnelling splitting value.
