

MOLECULAR HYDROGEN EMISSION FROM COLD CONDENSATIONS IN NGC 2440

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ABSTRACT. We report observations of the  $v = 1-0$  S(1) line of molecular hydrogen in the high excitation Planetary Nebula NGC 2440. The emission is particularly strong at the positions of the two bright condensations which lie well within the H II region and close to the position of the very hot  $T = 350,000$  K central star. The emission is consistent with an excited molecular hydrogen mass of  $2-4 \times 10^{-5} M_{\odot}$  in the condensations, and we estimate the total mass of excited molecular hydrogen associated with the H II region to be  $6 \times 10^{-3} M_{\odot}$ . We show that the radiation pressure from the central star is insufficient to excite the S(1) line emission. We also show that a stellar wind driven shock would imply a mass loss rate of  $3 \times 10^{-7} M_{\odot} \text{ yr}^{-1}$  if we adopt a wind velocity of  $2000 \text{ km s}^{-1}$ .