

## A SEARCH FOR STARS PASSING CLOSE TO THE SUN

J. GARCIA-SANCHEZ, R.A. PRESTON, D.L. JONES, P.R. WEISSMAN  
*JPL, California Institute of Technology, Pasadena, CA 91109, USA*

J.-F. LESTRADE  
*Observatoire de Paris-Meudon, 1<sup>er</sup> - 92195 Meudon Principal Cedex, France*

AND

D.W. LATHAM, R.P. STEFANIK  
*Harvard-Smithsonian CfA, Cambridge, MA 02138, USA*

We have combined radial velocity measurements with Hipparcos proper motion and parallax data for 552 nearby stars of a selected sample of 1208 stars to find which stars may have passed (or will pass) close enough to the Sun to perturb the cometary Oort cloud. We find that the rate of close stellar approaches within a distance 1) (in pc) from the Sun is  $N = 4.3 D^{2.02} \text{ Myr}^{-1}$ , in excellent agreement with the predicted functional form of simple stellar dynamics models though the number of stars is less than predicted. However, we consider this a lower limit because there is evidence for observational incompleteness in our data set. One star (Gliese 710) is found with a future closest approach of less than 0.4 pc, and several stars come within about 1 pc during about a  $\pm 10 \text{ Myr}$  interval. We have performed dynamical simulations which show that none of the passing stars in this sample can perturb the Oort cloud sufficiently to create a substantial increase in the long-period comet flux at the Earth's orbit.