thus instability are obtained when e exceeds a certain limiting value $e_{\max}$, which is found to be approximately 0.21 for very small reference librations, and to decrease with the increasing size of the basic long-period libration, as illustrated in the following tabulation for three such reference solutions:

d_0	A	$e_{\max}$
1.0001	0°22	0.21
1.01	21.35	0.16
1.02	43.06	0.08

Here d_0 denotes a parameter (Rabe, *loc. cit.*) closely related to the total longitudinal amplitude A of the reference libration. Only two known Trojans have A values exceeding 43°. If the more realistic elliptic restricted problem is considered, the listed values of $e_{\max}$ may still be increased by the approximate amount 0.05 of Jupiter's orbital eccentricity, to the first order of accuracy. While fourth- and higher-order terms have been omitted in this analysis, it is remarkable how well the here established theoretical limits for stable eccentricities account for the observed maximum of 0.15. This work was supported by the National Aeronautics and Space Administration.

Flare-Initiated Filament Oscillations. HARRY RAMSEY AND SARA F. SMITH, *Lockheed Solar Observatory*.—A study was made of eleven abruptly disturbed filaments photographed at 10 sec intervals with a $H\alpha$ 0.5 Å Halle filter. The abrupt disturbance in each filament was initiated during the occurrence of a major flare at a separate location on the solar disk. Graphs were constructed showing the changes in visibility of each filament as a function of time. The filament visibility graphs of events observed only in the center of $H\alpha$ were then compared to graphs of events in two wavelengths (center of $H\alpha$ and $H\alpha - 0.5$ Å) and with events observed in three wavelengths (center of $H\alpha$, $H\alpha - 0.5$ Å, and $H\alpha + 0.5$ Å). All of the filaments studied exhibited an oscillating motion observed or interpreted as moving first to the red wing, $H\alpha + 0.5$ Å, and then to the blue wing, $H\alpha - 0.5$ Å. As many as four distinct complete oscillations were visible with decreasing amplitude and apparent constant frequency. The frequency of oscillation varied from one filament to another, and did not appear to relate to the size of the flare, the inferred velocity of the initiating disturbance from the flare, or the distance from the flare. The range of frequencies encountered was 1.5 to 10 complete cycles per hour (6 to 40 min for one complete oscillation). Each filament appeared to have its own characteristic frequency of oscillation, repeating this frequency with each subsequent disturbance. One filament, disturbed four times in a three-day period, oscillated with essentially the same frequency each time.

21-cm Line Observations in the Perseus Region. J. J. RICKARD, *University of Maryland*.—Observations of 21-cm $H\text{ I}$ emission along the galactic plane ($b^{\text{II}}=0$) between $l^{\text{II}}=134^\circ$ and 154° have been evaluated. The data were obtained in the summer of 1963 at the beginning of the University of Maryland/NRAO 21-cm Galactic Survey program presently in progress. The 300-ft meridian telescope of the NRAO at Green Bank, W. Va., was used in conjunction with the DTM 90-channel Carnegie receiver. In front of the receiver was an experimental parametric amplifier which, unfortunately, introduced stray gain fluctuations into this early data. Twenty percent changes in gain from one day to the next were not uncommon; and the gain on any particular day was known only to an accuracy of $\pm 10\%$. As a result, the 10 min of arc 21-cm beamwidth of the 300 ft telescope had to be synthetically broadened during the reduction of the data to 17 min of arc to significantly reduce the noise. The temperature scale on the line profiles was calibrated using the earlier Leiden line profiles (Muller, C. A., and Westerhout, G., *Bull. Astron. Inst. Neth.* 13, 151 1957). The frequency resolution of the line profiles was also decreased from 2 to 3.4 km/sec in order to eliminate noise.

A contour map (a plot of brightness temperature as a function of galactic longitude, and radial velocity) of this 20° sector of the galactic plane displays some of the fine structure of the Perseus spiral arm and of the local Orion arm.

The Perseus arm seems to be composed of a broad, quite uniform band of $H\text{ I}$ in which there occur "clumps" of hydrogen clouds. The broad underlying $H\text{ I}$ band has a radial velocity width of 40 km/sec ± 2 km/sec. This means that there is considerable differential rotation across the spiral arm, and that it is over 2 kpc wide. The "clumps" of hydrogen clouds within the arm have a diameter of ~ 70 pc and an internal velocity dispersion of ~ 10 km/sec.

There is also a density gradient across the Perseus arm. The points of maximum density lie nearer to the inner edge of the arm.

An attempt was made to correlate in the $H\text{ I}$ features with galactic clusters, $H\text{ II}$ regions, and O associations located in this sector. Most of these objects seem associated with extensive $H\text{ I}$ regions. This might, however, simply indicate that the optical objects lie in or near the densest parts of the spiral arms. The I Cam O association is particularly well correlated with the $H\text{ I}$ as are NGC 1513, 1528, 1545, 1245, 1039, 1502, and IC 957. Further observations are necessary to establish a definite physical connection between the $H\text{ I}$ and these objects.

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