A survey of "Flaring Orion Variables" in the NSVS Database.

Nicholson, Martin, Remote Astronomical Society, Daventry, United Kingdom;
email newbinaries@yahoo.co.uk
Varley, Hannah, Remote Astronomical Society, Dublin, Ireland;
email hannahvfromdublin@yahoo.ie

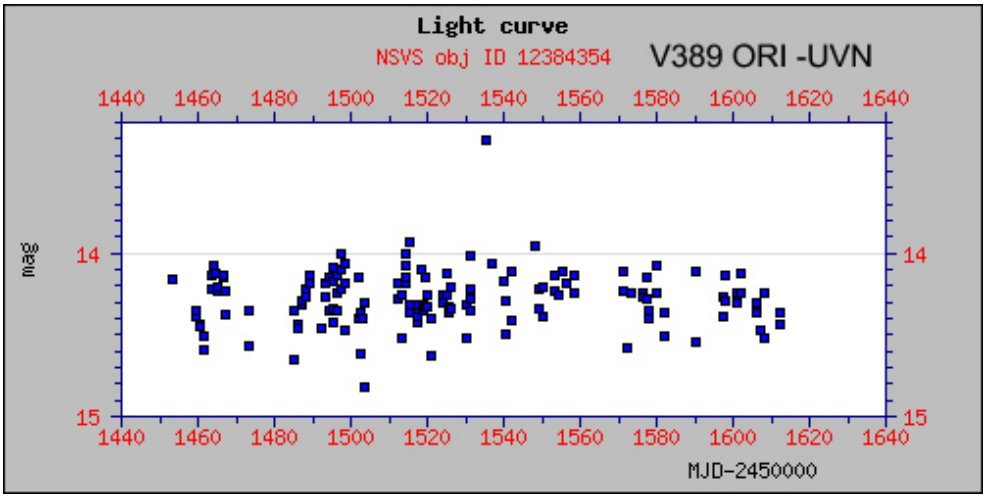
Introduction – The General Catalogue of Variable Stars defines "Flaring Orion Variables" in the following way :-

UVN *- "Flaring Orion variables of spectral types Ke-Me. These are phenomenologically almost identical to UV Cet variables observed in the solar neighbourhood. In addition to being related to nebulae, they are normally characterized by being of earlier spectral type and greater luminosity, with slower development of flares (V389 Ori). They are possibly a specific subgroup of INB variables with irregular variations superimposed by flares."*

INB *– "Orion variables of intermediate and late spectral types, F-M or Fe-Me (BH Cep, AH Ori). F-type stars may show Algol-like fadings similar to those of many INA stars; K-M stars may produce flares along with irregular light variations;*

Using the published NSVS data three characteristics of each star in the survey have been calculated.

- The magnitude range – the difference between the brightest and faintest reported magnitudes.
- The maximum change in 0.1 days – the largest magnitude change between two consecutive magnitude readings providing the two readings were taken within 0.1 days.
- The mean rate of change – the sum of all the magnitude changes between two consecutive magnitude readings (providing again that the two readings were taken within 0.1 days) divided by the number of events matching this requirement.



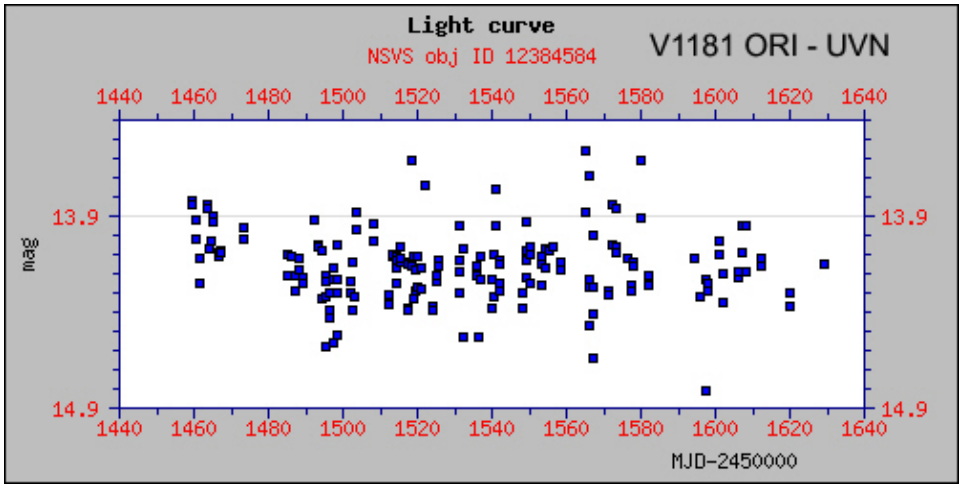
V389 ORI – Range 1.48, maximum change in 0.1 days = 0.51 fading
Mean rate of change = 6.43 mag/hour

The 21 Sample Stars

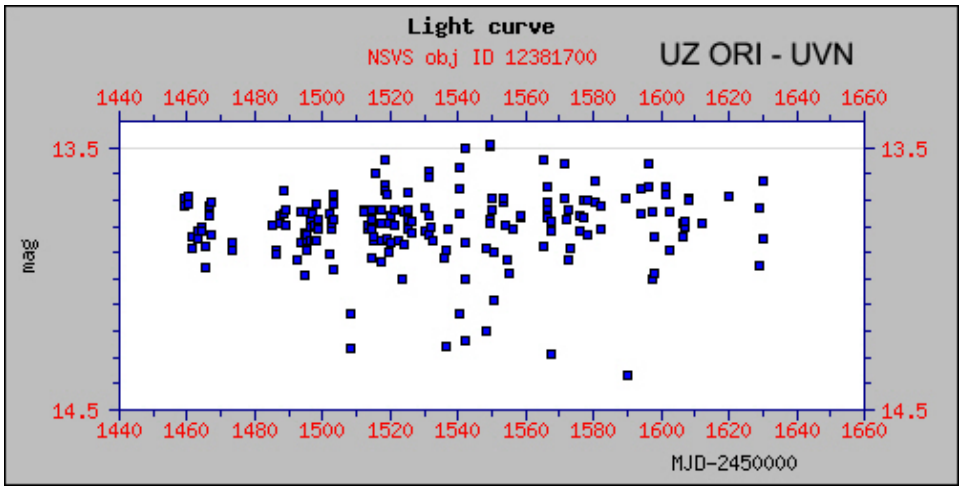
These have been arranged in descending order according to their mean rate of change.

Summary:-

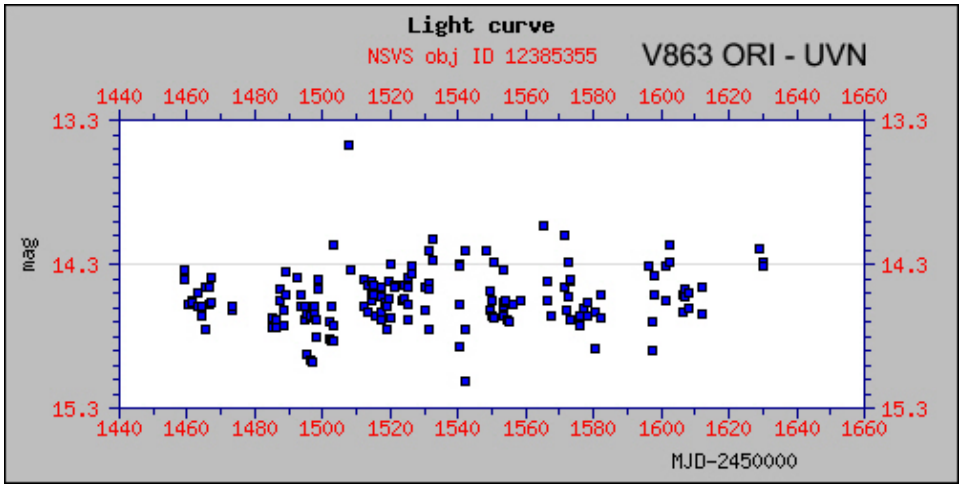
	Range	Maximum Change	Mean Change
Largest	**1.69**	**0.99**	**9.67**
Smallest	**0.23**	**0.10**	**1.67**
Example (V389 ORI)	**1.48**	**0.51**	**6.43**



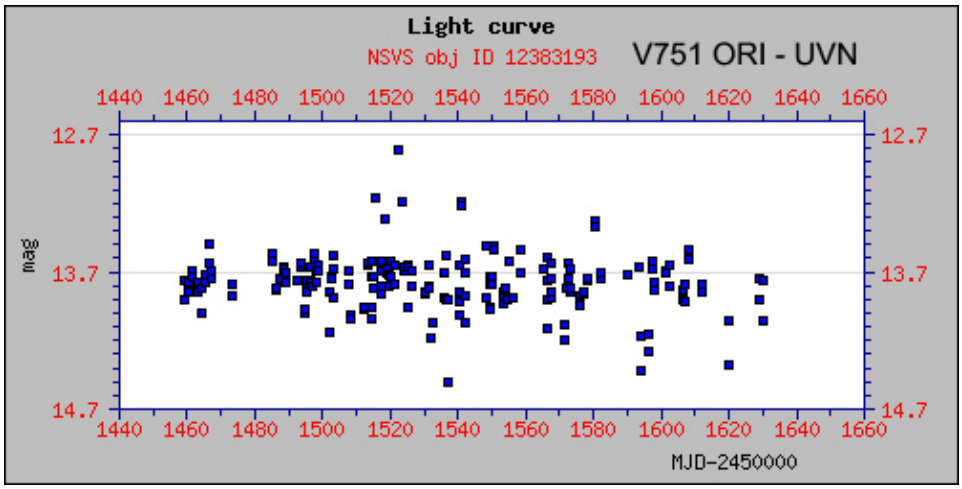
V1181 ORI – Range 1.25, maximum change in 0.1 days = 0.64 brightening
Mean rate of change = 9.67 mag/hour



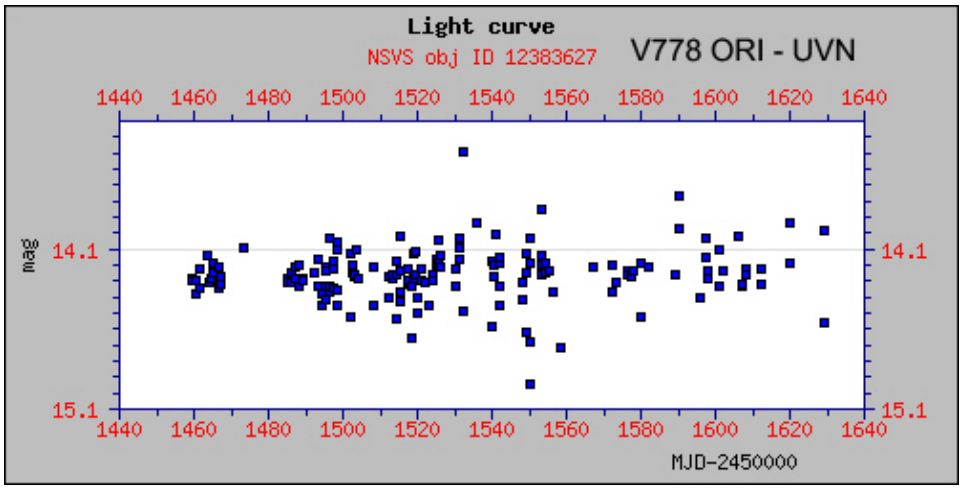
UZ ORI – Range 0.88, maximum change in 0.1 days = 0.56 fading
Mean rate of change = 8.84 mag/hour



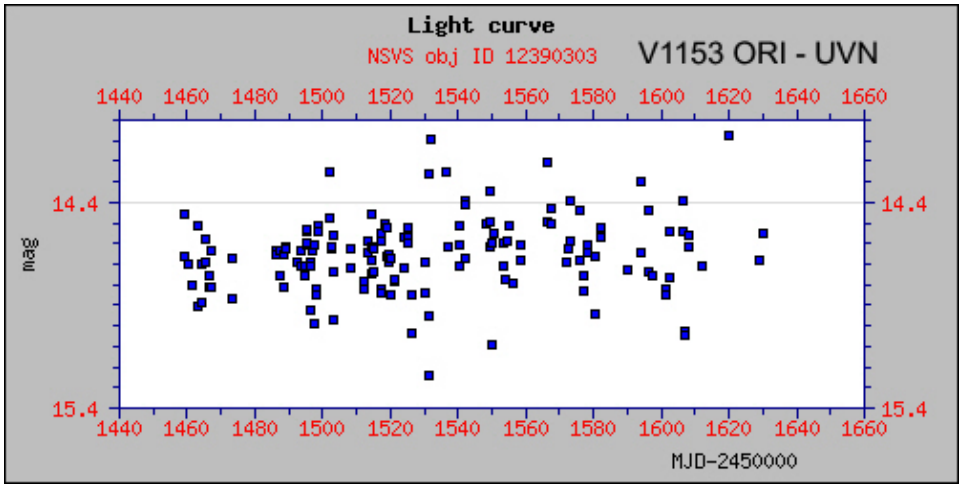
V863 ORI – Range 1.63, maximum change in 0.1 days = 0.58 fading
Mean rate of change = 8.31 mag/hour



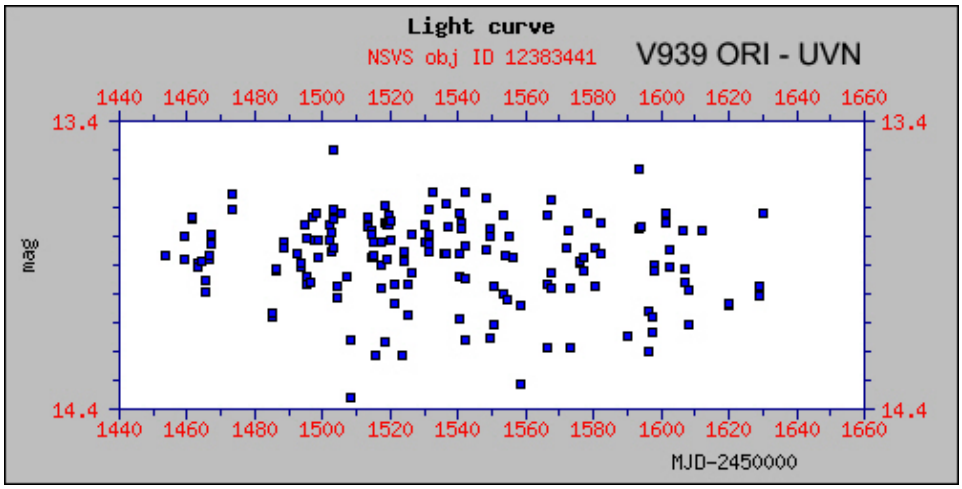
V751 ORI – Range 1.69, maximum change in 0.1 days = 0.60 fading
Mean rate of change = 7.69 mag/hour



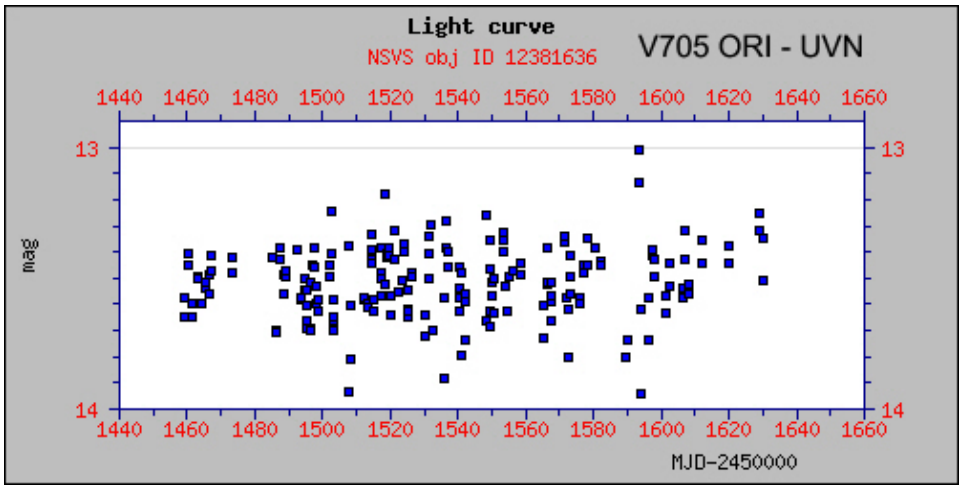
V778 ORI – Range 1.46, maximum change in 0.1 days = 0.99 fading
Mean rate of change = 7.34 mag/hour



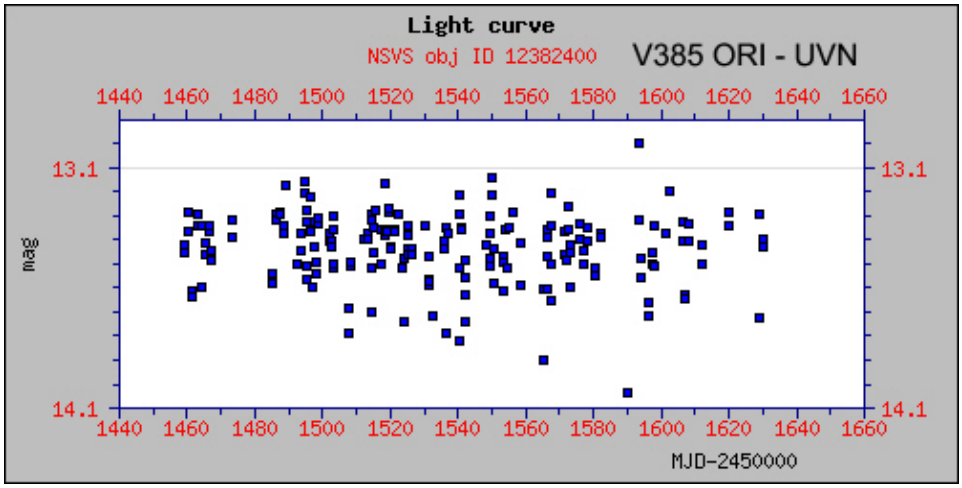
V1153 ORI – Range 1.17, maximum change in 0.1 days = 0.49 brightening
Mean rate of change = 7.28 mag/hour



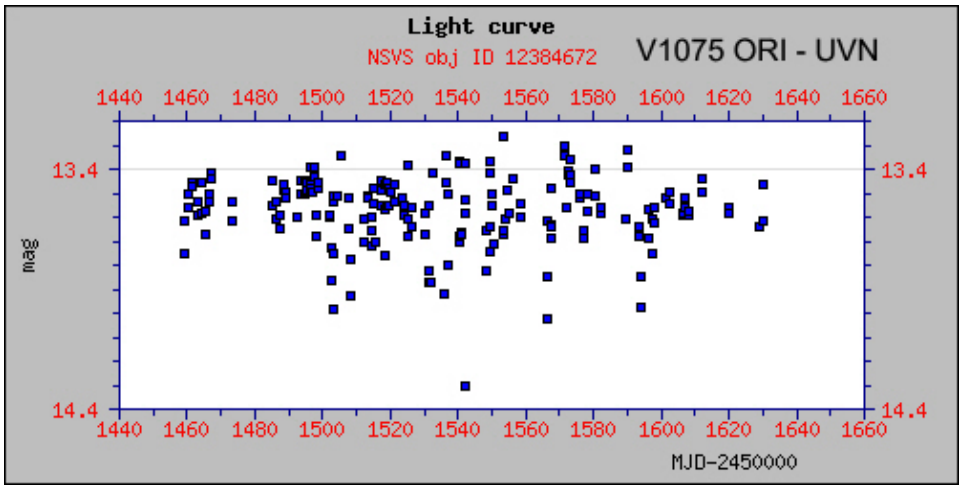
V939 ORI – Range 0.79, maximum change in 0.1 days = 0.51 brightening
Mean rate of change = 6.80 mag/hour



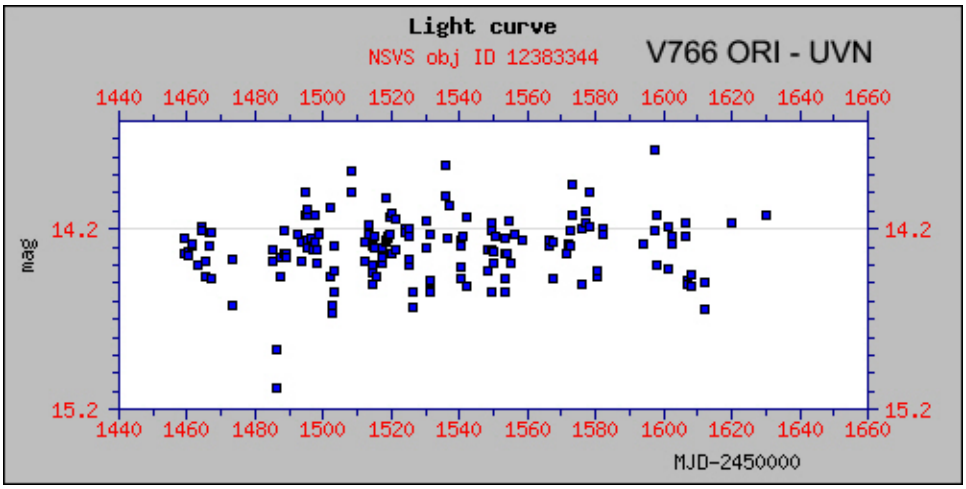
V705 ORI – Range 0.93, maximum change in 0.1 days = 0.60 brightening
Mean rate of change = 6.78 mag/hour



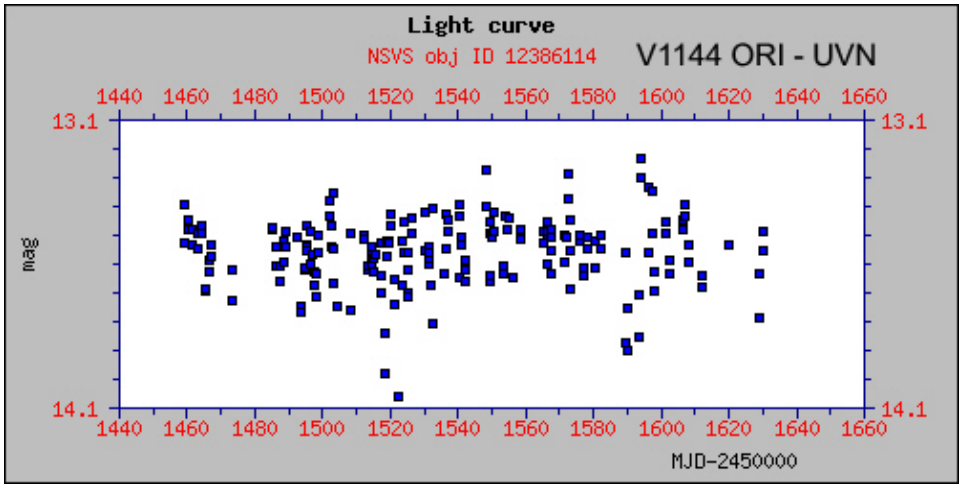
V385 ORI – Range 1.04, maximum change in 0.1 days = 0.44 fading
Mean rate of change = 6.46 mag/hour



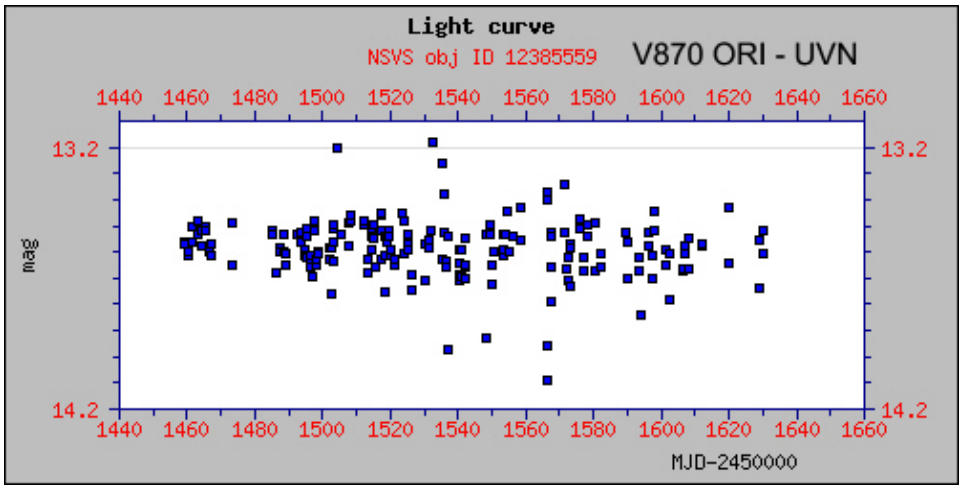
V1075 ORI – Range 1.04, maximum change in 0.1 days = 0.72 fading
Mean rate of change = 6.27 mag/hour



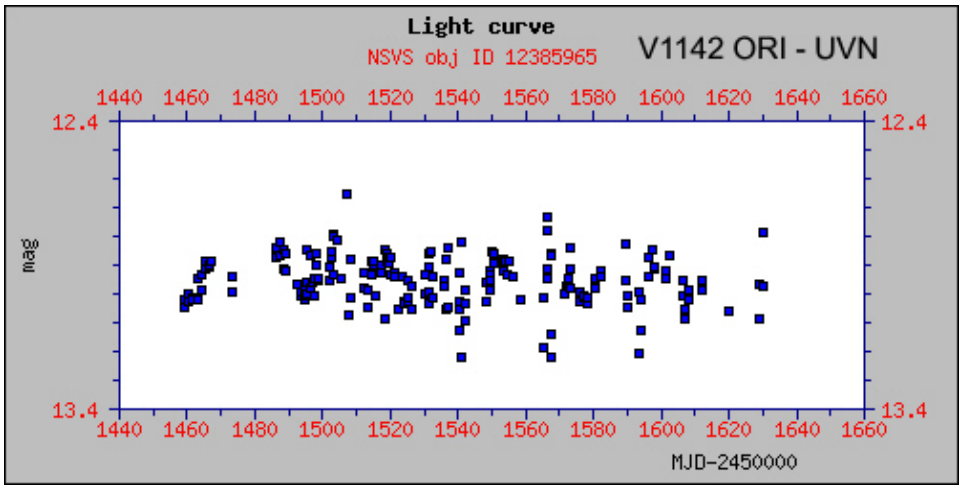
V766 ORI – Range 1.32, maximum change in 0.1 days = 0.45 brightening
Mean rate of change = 6.05 mag/hour



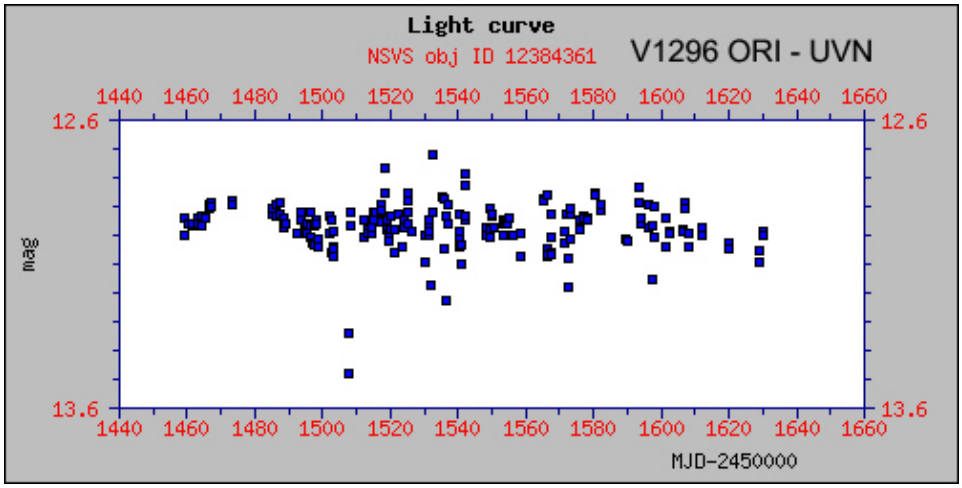
V1144 ORI – Range 0.82, maximum change in 0.1 days = 0.40 brightening
Mean rate of change = 5.45 mag/hour



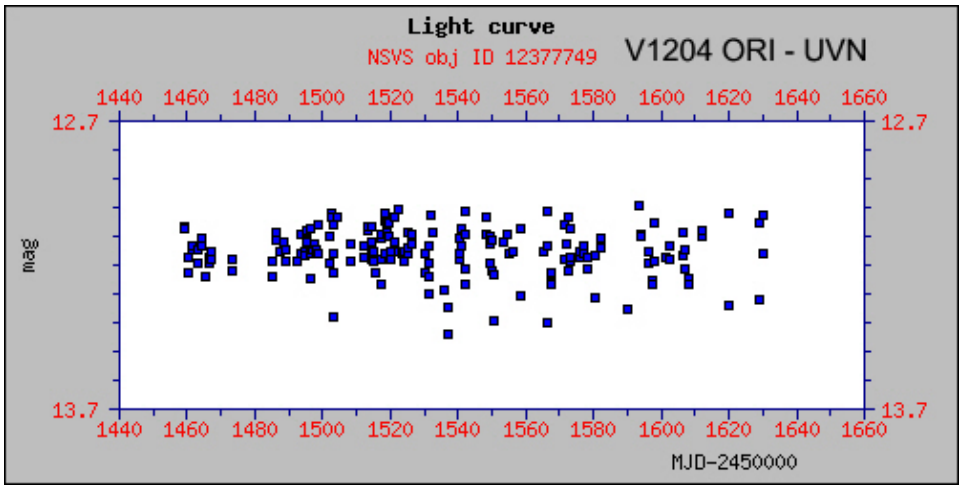
V870 ORI – Range 0.91, maximum change in 0.1 days = 0.56 fading
Mean rate of change = 5.36 mag/hour



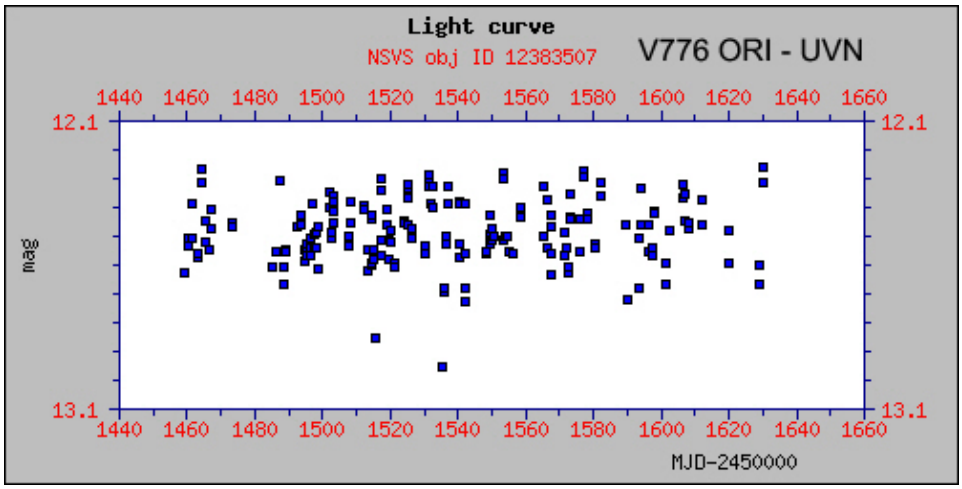
V1142 ORI – Range 0.57, maximum change in 0.1 days = 0.40 fading
Mean rate of change = 4.63 mag/hour



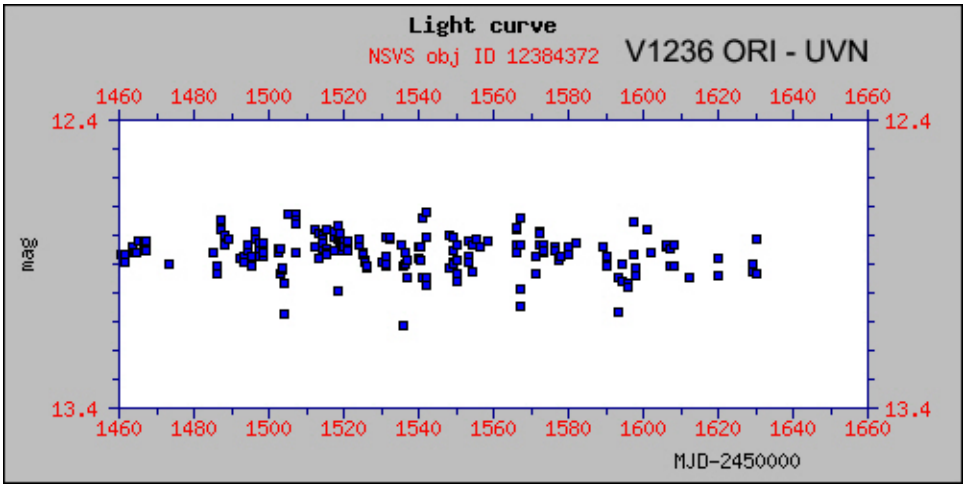
V1296 ORI – Range 0.76, maximum change in 0.1 days = 0.45 brightening
Mean rate of change = 4.35 mag/hour



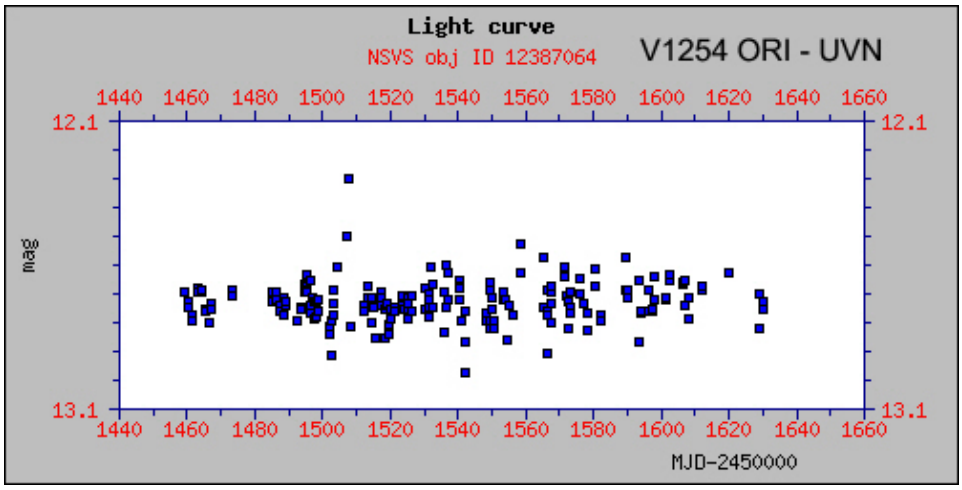
V1204 ORI – Range 1.45, maximum change in 0.1 days = 0.32 brightening
Mean rate of change = 3.94 mag/hour



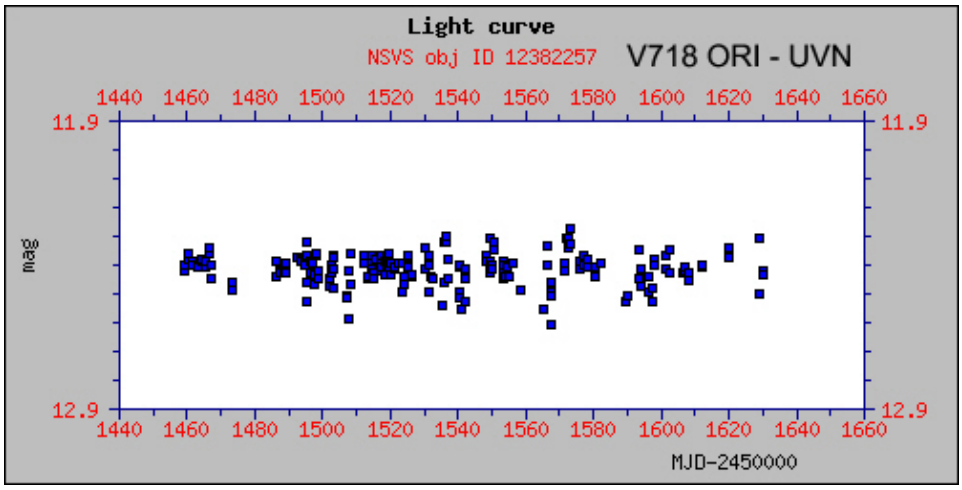
V776 ORI – Range 0.69, maximum change in 0.1 days = 0.31 fading
Mean rate of change = 3.53 mag/hour



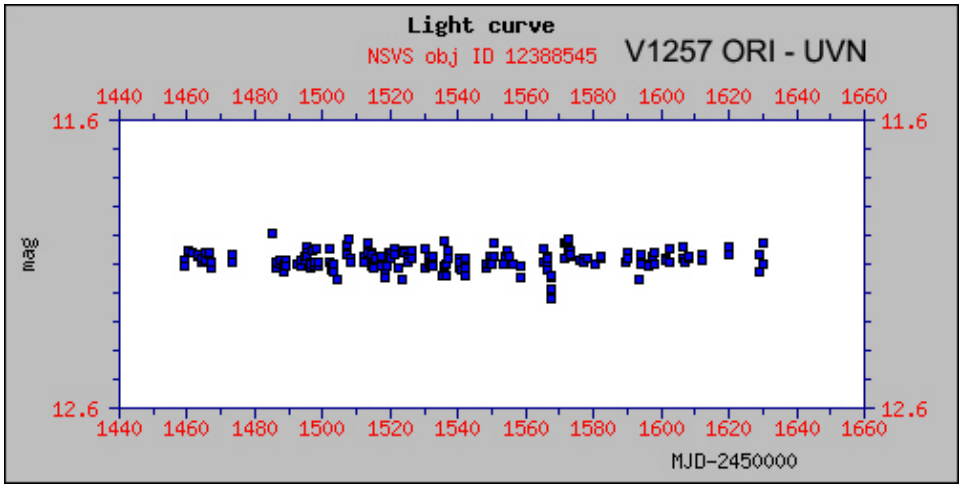
V1236 ORI – Range 0.39, maximum change in 0.1 days = 0.31 brightening
Mean rate of change = 3.51 mag/hour



V1254 ORI – Range 0.67, maximum change in 0.1 days = 0.24 brightening
Mean rate of change = 3.45 mag/hour



V718 ORI – Range 0.33, maximum change in 0.1 days = 0.19 brightening
Mean rate of change = 2.93 mag/hour



V1257 ORI – Range 0.23, maximum change in 0.1 days = 0.10 fading
Mean rate of change = 1.67 mag/hour

Analysis: Although all the survey stars studied share the same GCVS classification it is hard to accept, *based on the NSVS data,* that the stars are all of the same type.

There are particular problems with the following :

- V1257 ORI – There is no evidence of flares and both the magnitude range and mean rate of change is the lowest of all the stars studied.
- V718 ORI – Little or no evidence of flares and both the magnitude range and mean rate of change are low.
- V776 ORI, V1204 ORI and V1236 ORI – All three seem to be closer to INB variables than UVN.

This project was carried out under the auspices of the Remote Astronomical Society (http://www.ras-observatory.org/ras/front.htm)