

High Dispersion Spectroscopy of Slowly-Rotating Solar-Type Stars Showing Superflares

Yuta Notsu (Kyoto University)

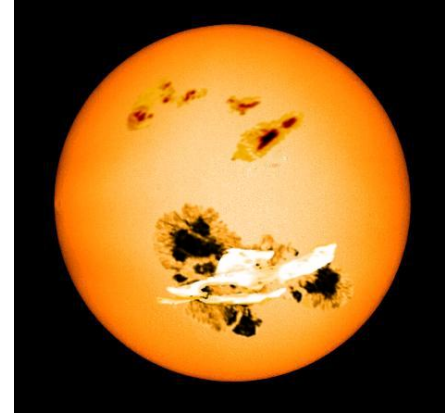
Honda,S. (Univ. Hyogo), Maehara,H.(Univ. Tokyo),
Notsu S., Shibayama,T., Nogami,D., Shibata K.(Kyoto Univ.)

Related talk:

Nogami-san's presentation (tomorrow)

“Spectral Properties of Superflare Stars, KIC 9766237, and KIC 9944137”

Superflares on Solar-type stars

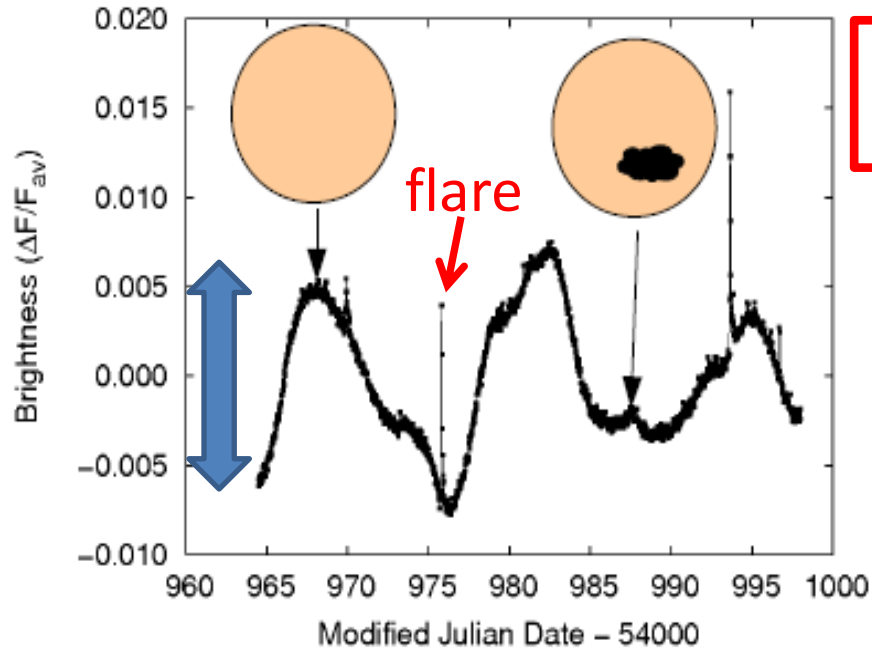


▪ Superflare

very large flares that release total energy $10\text{-}10^4$ times greater than that of the biggest solar flares ($\sim 10^{32}$ erg).

▪ Kepler data

⇒ We found 1547 superflares on 279 Solar-type (G-type main sequence) stars. (Maehara et al. 2012, Shibayama et al. 2013)



Many superflare stars show **quasi-periodic brightness variations with $P=1\text{-}30$ d.**



? Rotation of the star with starspots?

Brightness variation

Period ⇒ Stellar rotational period

Amplitude ⇒ Sizes of starspots

Is this true??

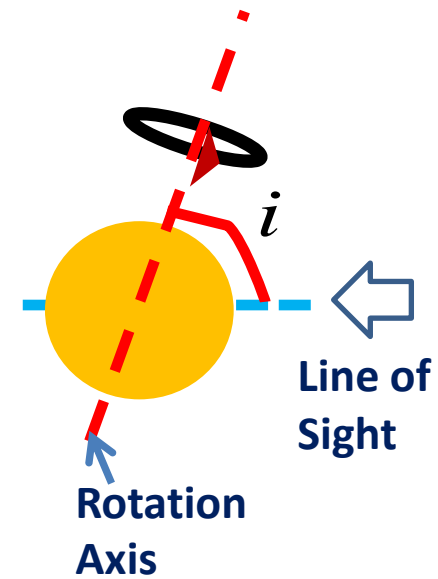
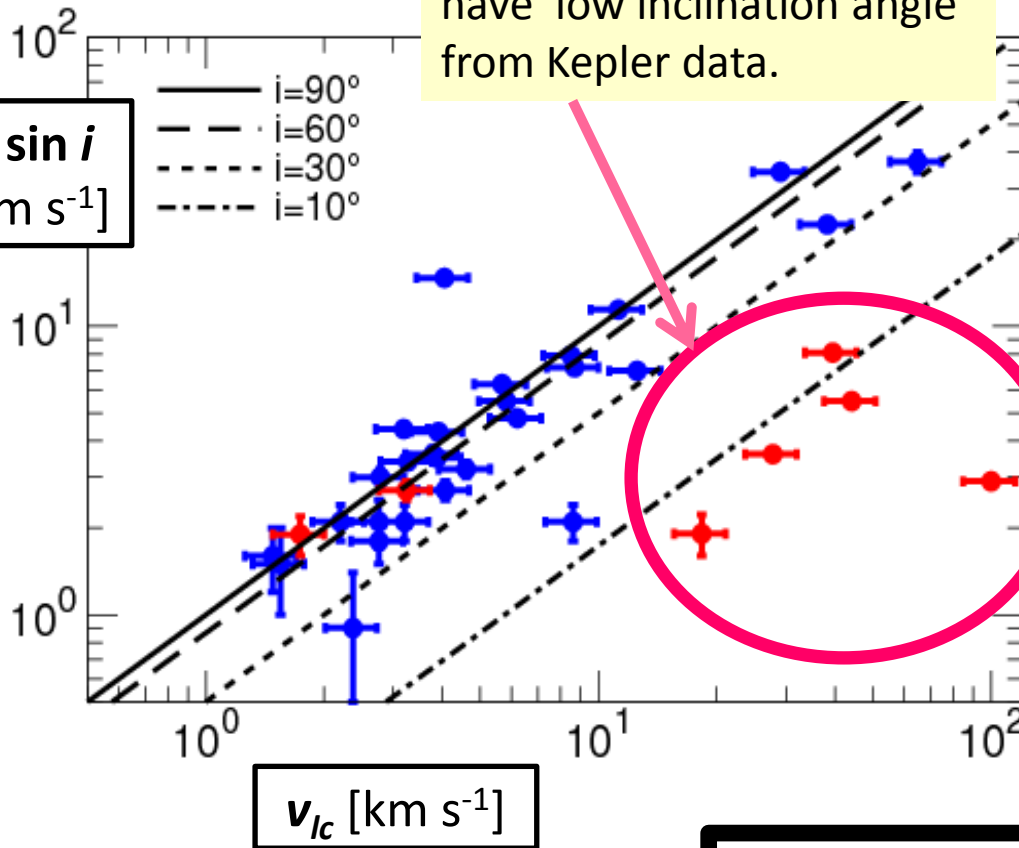
⇒ High Dispersion Spectroscopic Observations

Comparing the **brightness variation period** with “ $v \sin i$ ”



These two values are **consistent!!**

These stars are expected to have low inclination angle from Kepler data.



We also discuss **chromospheric activities** (by using **Ca II IR triplet line**).

More and detailed observations are also needed in the next step!!!