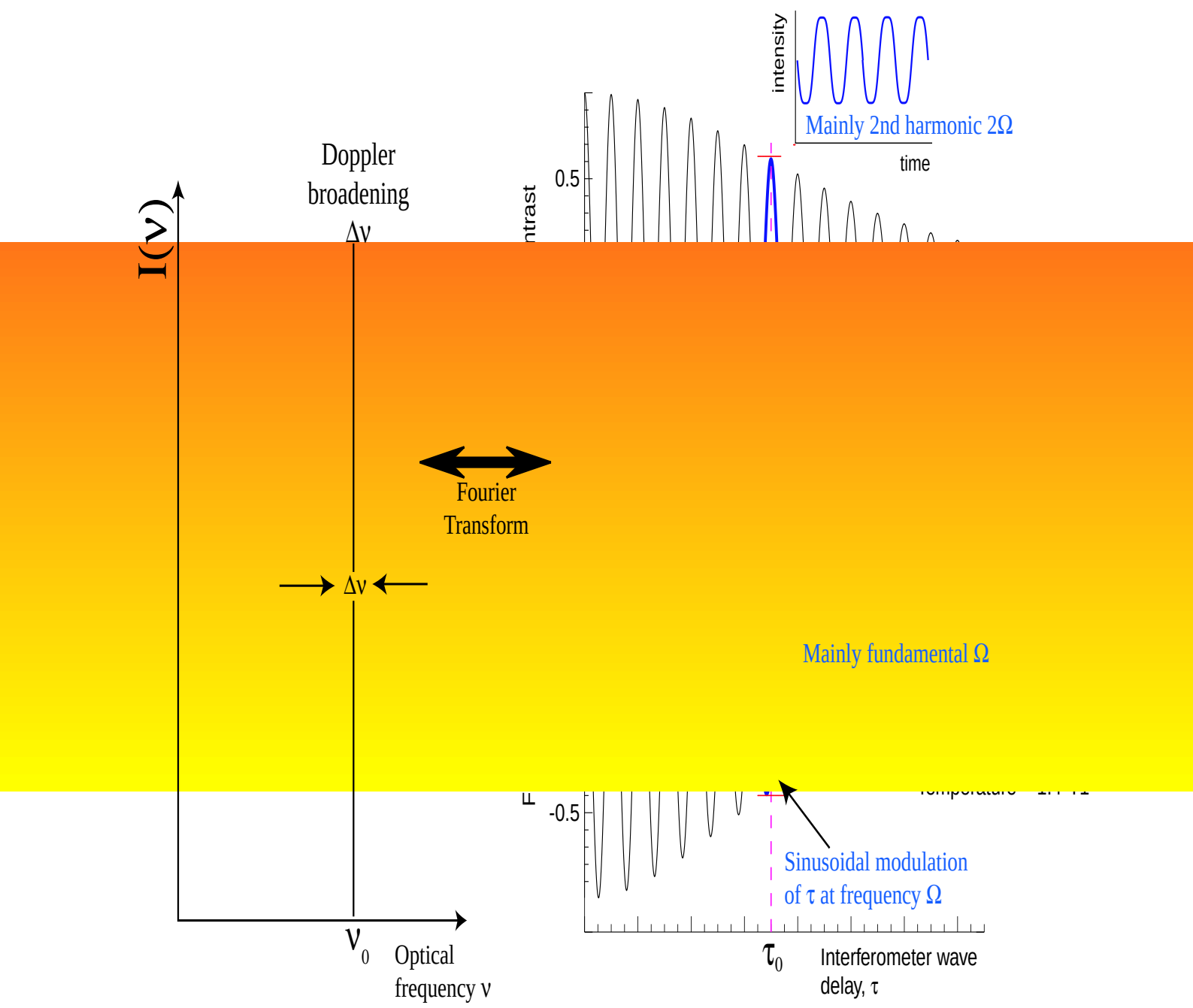
MOSS is a FTS Modulated about a Single Fixed Delay



Why Fourier Transform Spectroscopy Works

The Fourier transform separates the flow and the body of the distribution function:

$$f(\boldsymbol{r}, (\boldsymbol{v}-\boldsymbol{v}_d).\boldsymbol{l}) \Rightarrow \exp(i\phi \boldsymbol{v}_d.\boldsymbol{l})\ F(\boldsymbol{r},\phi)$$

ϕ is a phase (time) delay coordinate conjugate to the optical frequency ν

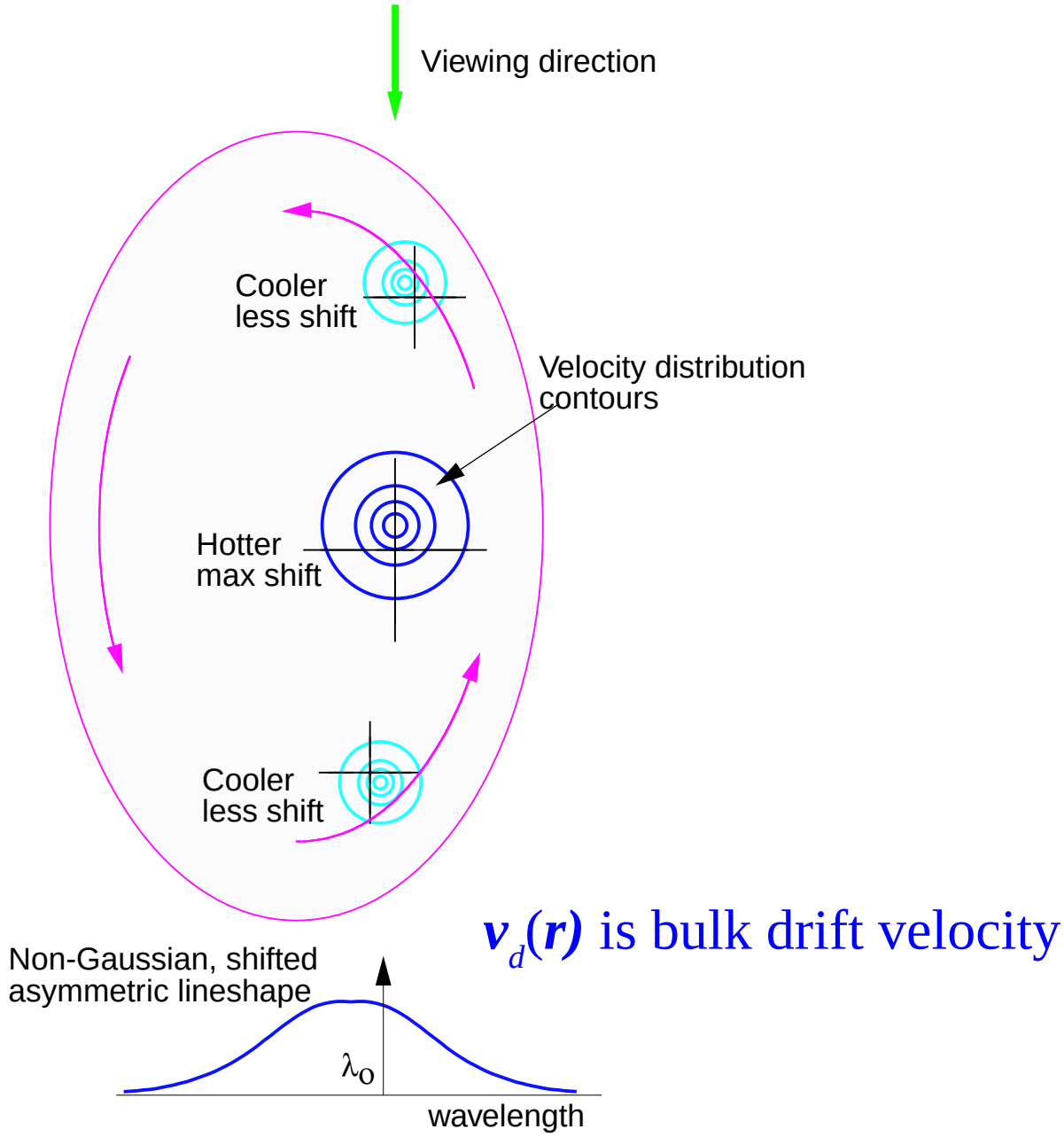
The shift and shape separate

For a Fourier transform spectrometer:
The shift is carried by the coherence phase
The shape is carried by the fringe visibility

When $F(\boldsymbol{r},\phi)$ is characterised by a single parameter (e.g. temperature), tomography of the the drift (shift) and temperature (shape) profiles **requires measurements at a only single delay ϕ**

Doppler Tomography

Doppler spectroscopy measures the distribution $f(\boldsymbol{r}, (\boldsymbol{v}-\boldsymbol{v}_d).\boldsymbol{l})$ integrated along line-of-sight.



$\boldsymbol{v}_d(\boldsymbol{r})$ is bulk drift velocity

Grating spectrometers must measure full line profile to unravel contributions from different plasma positions

Results from the Modulated Optical Solid State spectrometer

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- Doppler Tomography
- Measurement Principle
- Hardware and Software
- H-1 Single Channel System
- MOSS Camera
- ToMOSS
- Spread Spectrum Methods - SOFT
- Polarization Spectroscopy
  - Motional Stark Effect
  - Zeeman Effect