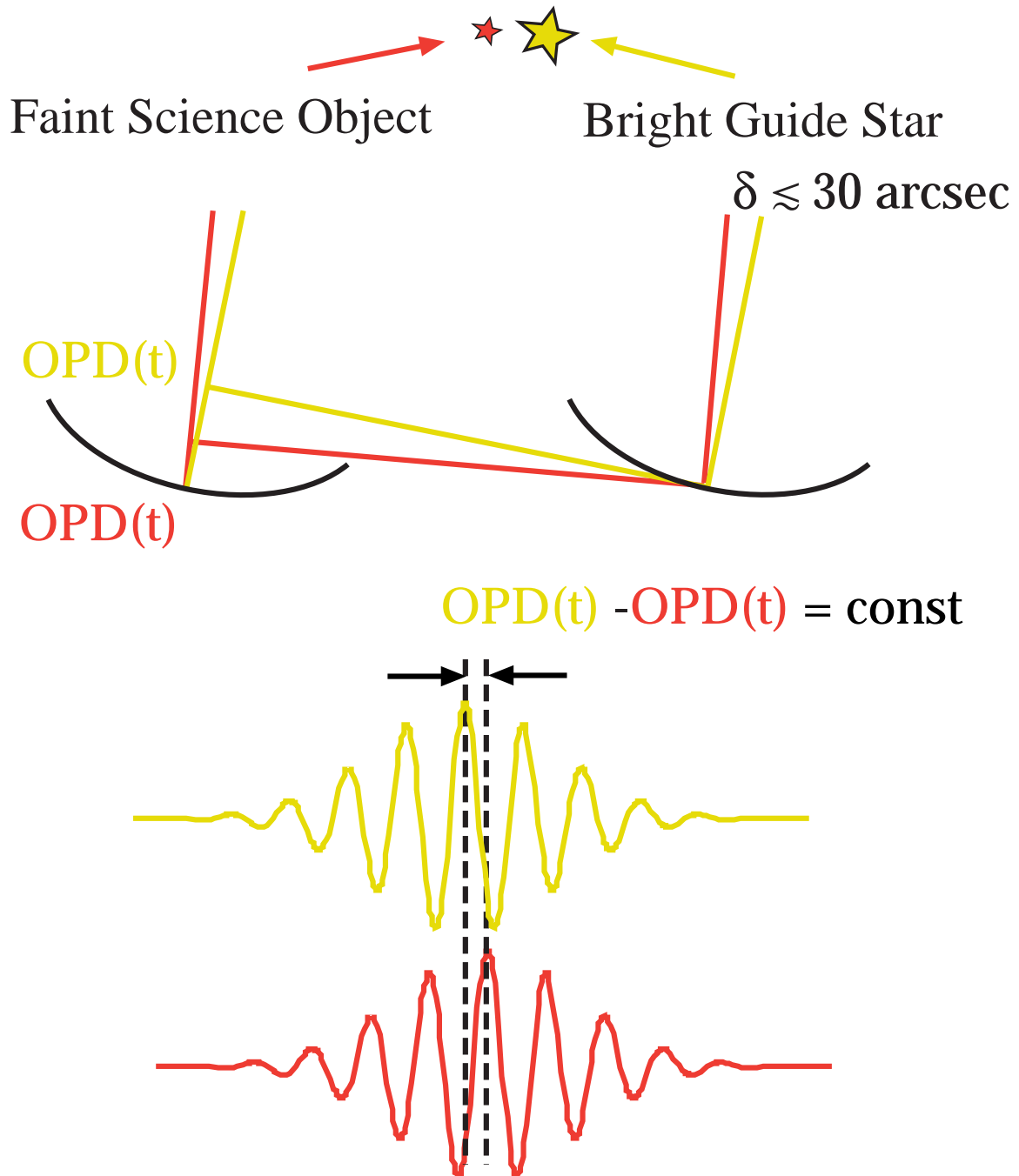


PRIMA - **The VLTI Dual Feed System**

**The Dual Feed Mode enhances
the VLTI capabilities in three areas**

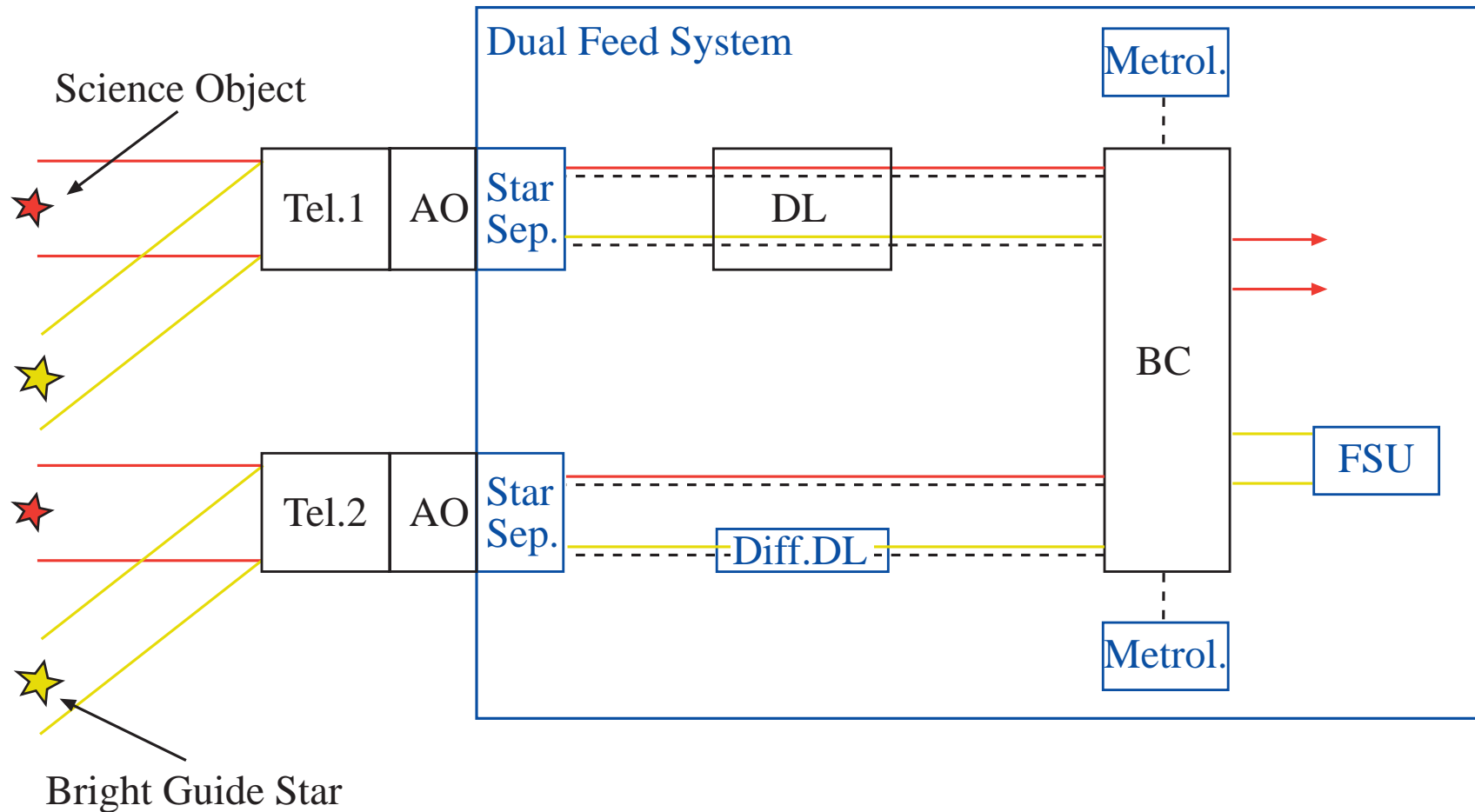
- **Observations of faint objects**
- **Imaging of faint objects**
- **Astrometry**

Dual Feed



- **Tracking the fringes of the guide star
=> Fringes of science object are stabilised**
- **Dual Feed = Feed two stars into delay line**

PRIMA Components



- **Star separator**
- **Differential delay lines (Diff. DL)**
- **Laser Metrology (Metrol.)**
- **Fringe sensor unit (FSU)**

“Standard” components:

- **Adaptive Optics (AO)**
- **Delay lines (DL)**
- **Beam combiner (BC)**

PRIMA Feasibility Study

Purpose:

- **Finding the best technical solution**
- **Obtaining a precise cost estimate**

Specifications:

- **Star separator**
Two fields of 2" separated by up to 1'
- **Laser metrology system**
Monitor internal OPD
with 5 nm rms over 30 min
- **Differential delay lines**
Provide differential delay
with 5nm rms
- **Fringe sensor unit**
Measure fringe position
with 30 nm rms on H = 13 (UT's)

Project Plan

- **Feasibility study** **February 1999**
- **Call for Tender for manufacturing** **July 1999**
- **Kick-off for contracts** **November 1999**
- **Delivered in Garching** **December 2001**

Implementation Approach

- **Phase I**
Star separator + Fringe sensor unit
 - **Exposure time 10-100 sec (K = 15-17)**
- **Phase II**
Differential delay line + laser metrology
 - **500 nm rms over 10 min**
=> Strehl ~30% (K = 19)
 - **5 nm rms over 30 min**
=> 10 micro arcsec astrometry

PRIMA

Three operating modes:

- **Tracking Mode:**
‘Simple’ fringe tracking on a guide star
Observations with AMBER or MIDI
 - Guide Star K~14 within 0.5-1 arcmin
- **Imaging Mode:**
Image reconstruction by measuring V and ϕ for many baselines
 - Laser metrology for internal OPD
- **Astrometry:**
Distance of two point like stars determined by fringe positions
 - <10 micro arcsec accuracy