Details on MIDI and its instrumental modes can be found on the **MIDI web page**.

The raw accuracy of the visibility measurements is typically better than 20%. A proposal can consist of different observations of the same target with different baselines and/or hour angles in which case the observing time to be requested simply computes as the number of required time slots multiplied by the duration of one slot as given in Table 19 below. Time constrained observations (*e.g.* variable objects) can further be requested in the appropriate section of the proposal.

FINITO (the VLTI fringe-tracker) is likely to be available for MIDI, however tests for this combination are still in progress. It seems that in most cases the availability of FINITO will not change the basic performance of MIDI. Users are asked to submit their proposals without mentioning any possible use of FINITO. The performance and characterization of FINITO with MIDI is ongoing. Users will be given the option to specify the inclusion of FINITO at Phase 2.

6.11.1 ATs and UTs

MIDI (and AMBER) can be used with either the ATs or the UTs.

The UTs are equipped with MACAO (Multi Application Curvature Adaptive Optics) units, which provide diffraction-limited images on MIDI for targets with $1 < V < 17$, seeing $< 1.5''$, $\tau_0 > 1.5$ ms and airmass < 2. The distance of the AO natural guide star from the science target is restricted to be within $57.5''$.

The ATs are equipped with STRAP units, which provide tip-tilt correction for targets brighter than V=13.5. The distance of the guide star from the science target is restricted to be within $57.5''$.

Generally, the UTs are available for interferometry for a few days each month. For this reason, we recommend that scientific programs are designed so that scientifically meaningful results can be achieved in a single night. For monitoring of the target-visibility evolution over time scales of several weeks, preference should be given to the ATs.

Proposers should be aware that reconfigurations of the ATs are restricted and are not planned to occur in intervals smaller than 2 weeks. Proposers that require more frequent reconfigurations should clearly indicate this in their proposal but should be aware that this be considered in exceptional circumstances only.

6.12 AMBER, Astronomical Multi-BEam combineR

AMBER is a near-infrared, multi-beam interferometric instrument, combining simultaneously up to 3 telescopes. AMBER can be used in Period 80 with UTs or ATs (see Sects. 6.12.2 and 6.12.3 for performance specifications). All possible triplets of UTs are available, and a number of selected AT combinations. For the telescope positions and baseline lengths of the different AT and UT baselines, please refer to **http://www.eso.org/instruments/amber/inst/**.

Because of the scarce availability of the UTs for AMBER, it is recommended that any scientific program for the UTs is designed so that scientifically meaningful results can be achieved in a single night. For specifications on the UT and AT performances see Sect. 6.11 above.

6.12.1 Integration times, DIT, and Spectral Modes and Coverage

The following spectral modes are offered: the Low Resolution K band (LR-HK), Medium Resolution K band (MR-K), and High Resolution K band (HR-K). For central wavelengths and wavelength coverage for LR-HK, MR-K and HR-K see
http://www.eso.org/instruments/amber/inst/index.html. Users interested in obtaining visibility measurements at several spectral positions inside the range allowed by each configuration can add up to two additional spectral bands.

External fringe tracking with FINITO is now available on the ATs. Longer DITs are possible allowing AMBER to use HR-K and the readout of the full chosen spectral band in MR-K and HR-K.

Table 18: AMBER limiting magnitudes without FINITO

Spectral Mode	**Telescopes**			
	UTs	**ATs**		
	DIT=25ms	DIT=25ms	DIT=50ms	DIT=100ms
LR-HK	K=7	K=3.6, H=4.0	K=4.4 H=4.8	K=5.1 H=5.5
MR-K	K=4	K=0.6	K=1.1	K=1.6
HR-K	K=1.5	–	–	–

If no fringe tracker is used (i.e., UTs or faint objects in LR-HK on the ATs), the integration times with AMBER will have to be short to minimise atmospheric turbulence, and are fixed for LR-HK and MR-K to a DIT of 25 ms on the UTs and 25 ms or 50 ms on the ATs if absolute visibility measurements are the goal. For differential mode observations the maximum allowed DIT is twice the DIT allowed in absolute mode. DITs longer than this can only be done in Visitor Mode. In HR-K it is assumed a DIT of 50 ms for absolute visibilities. In Visitor Mode longer DITs up to 100 ms can be used under exceptional weather conditions or if only differential phase is the goal.

6.12.2 Limiting magnitudes and Visibility Accuracy without FINITO

Note that these are the limits for an unresolved source, i.e., with a calibrated visibility of unity. Resolved sources will have lower limiting magnitudes corresponding to their visibility. Please note that the magnitudes in the table above are estimated under the assumption of 0.8" seeing, and they can be significantly degraded as a result of atmospheric conditions. In particular for poor seeing and τ_0 (above 1.2" and below 2.5ms respectively), a loss of sensitivity of one magnitude or more can be expected.

Reversely, please note that the magnitudes are estimates on the basis of at least 50% of the frames being successfully processed by the AMBER pipeline. If a lower yield rate is accepted, an increase of up to 0.5 in the limiting magnitude can be achieved. In this case, the user might want to account for one or more repeated observations of the same spectral band in her/his proposal (see Sect. 6.12.4 below) to obtain more frames with sufficient SNR.

The visibility accuracy is 3% on the UTs and 2-10% on the ATs depending on the source magnitude. These numbers corresponding to one set of observations. The minimum visibility measurable is 10% on the UTs and 5% on the ATs.

6.12.3 Limiting magnitudes and Visibility Accuracy with FINITO and the ATs

FINITO operations are only feasible for seeing below 1.2", τ_0 above 2.5ms, and airmass < 1.5. The limiting correlated magnitude for FINITO is $H = 3$ and the minimum visibility in the H band is 15%. These numbers were determined with a seeing < 0.8" and τ_0 above 2.5ms. Assuming that these conditions are met the limiting magnitudes for AMBER are $K = 3$ in LR-KH, MR-K and HR-K. Note that 70% of the H-band flux is sent to FINITO so if H-band is of interest the DITs should be adjusted accordingly. The visibility accuracy is 2% with one set of exposures. The minimum visibility measurable is 5% with AMBER in the K band and 15% with FINITO in the H band.

6.12.4 Execution times

The user should assume that 90 minutes are required for one instantaneous measurement of calibrated visibilities (i.e., a measurement of the science object and a measurement of an interferometric calibrator star). This applies to all spectral modes with only one band. Each additional band in the observation adds 30 minutes to the total time. A maximum of 3 bands per observation is allowed. Users can find more information about AMBER, including its Users' Manual, under
http://www.eso.org/instruments/amber.