Doppler calculations

The formulae used to calculate Doppler corrections when observing with the WAPPs have been modified to take the second-order term into account:

Back-end:	**WAPP**	**WAPP**
Used**:**	before 2007–02–08	after 2007–02–08
v(opt):	$f_1 = f_0 \cdot \frac{1}{1+\frac{v_{obj}}{c}+\frac{v_{ant}}{c}}$	$f_1 = f_0 \cdot \frac{1}{1+\frac{v_{obj}}{c}+\frac{v_{ant}}{c}+\frac{v_{obj} \cdot v_{ant}}{c^2}}$
z(opt):	$f_1 = f_0 \cdot \frac{1}{1+z_{obj}+\frac{v_{ant}}{c}}$	$f_1 = f_0 \cdot \frac{1}{1+z_{obj}+\frac{v_{ant}}{c}+\frac{z_{obj} \cdot v_{ant}}{c}}$
z(rad):	$f_1 = f_0 \cdot (1 - z_{obj} - \frac{v_{ant}}{c})$	$f_1 = f_0 \cdot (1 - z_{obj} - \frac{v_{ant}}{c} + \frac{z_{obj} \cdot v_{ant}}{c})$

Current formulae used when observing with the interim correlator:

Back-end:	**ICORR**
v(opt):	$f_1 = f_0 \cdot \frac{1}{1+\frac{v_{obj}}{c}+\frac{v_{ant}}{c}}$
z(opt):	$f_1 = f_0 \cdot \frac{1}{1+z_{obj}+\frac{v_{ant}}{c}+\frac{z_{obj} \cdot v_{ant}}{c}}$
z(rad):	$f_1 = f_0 \cdot \frac{1-z_{obj}}{1+\frac{v_{ant}}{c}}$

For ICORR, v_{ant} is coded with the opposite sign. The formulae presented here have the sign changed from what is in the ICORR code, so that v_{ant} here refers to the WAPP convention.

Mikael Lerner, 2006–02–08