

Table 8 Pairwise comparison of gap values ($\frac{A}{B}$) for direct algorithms in three groups

$\begin{smallmatrix} B \\ A \end{smallmatrix}$	MPCC	WDP	MDP	eMDP	TWDP	TMDP	eTMDP	ETMDP
WDP	$\frac{0.98}{1.08} / \frac{0.09}{0.27} / \frac{0.55}{0.59}$	-	-	-	-	-	-	-
MDP	$\frac{0.89}{0.93} / \frac{0.14}{0.30} / \frac{0.52}{0.64}$	$\frac{0.90}{0.87} / \frac{0.17}{0.16} / \frac{0.46}{0.59}$	-	-	-	-	-	-
eMDP	$\frac{1.04}{1.02} / \frac{0.20}{0.26} / \frac{0.70}{0.56}$	$\frac{1.00}{0.89} / \frac{0.26}{0.26} / \frac{0.62}{0.55}$	$\frac{0.98}{0.90} / \frac{0.27}{0.15} / \frac{0.61}{0.48}$	-	-	-	-	-
TWDP	$\frac{0.83}{0.88} / \frac{0.14}{0.26} / \frac{0.64}{0.67}$	$\frac{0.85}{0.86} / \frac{0.13}{0.12} / \frac{0.47}{0.61}$	$\frac{0.85}{0.88} / \frac{0.18}{0.13} / \frac{0.58}{0.49}$	$\frac{0.86}{0.95} / \frac{0.22}{0.27} / \frac{0.45}{0.64}$	-	-	-	-
TMDP	$\frac{0.91}{0.96} / \frac{0.09}{0.31} / \frac{0.74}{0.67}$	$\frac{0.90}{0.87} / \frac{0.10}{0.22} / \frac{0.51}{0.62}$	$\frac{0.89}{0.87} / \frac{0.12}{0.15} / \frac{0.65}{0.51}$	$\frac{0.94}{0.99} / \frac{0.09}{0.26} / \frac{0.51}{0.66}$	$\frac{0.89}{0.84} / \frac{0.08}{0.21} / \frac{0.70}{0.58}$	-	-	-
eTMDP	$\frac{1.23}{1.09} / \frac{0.27}{0.25} / \frac{0.56}{0.52}$	$\frac{1.14}{0.96} / \frac{0.31}{0.09} / \frac{0.51}{0.52}$	$\frac{1.02}{0.90} / \frac{0.36}{0.23} / \frac{0.55}{0.45}$	$\frac{1.06}{1.02} / \frac{0.57}{0.27} / \frac{0.45}{0.59}$	$\frac{0.99}{0.84} / \frac{0.26}{0.11} / \frac{0.53}{0.58}$	$\frac{1.07}{0.98} / \frac{0.44}{0.07} / \frac{0.52}{0.64}$	-	-
ETMDP	$\frac{0.88}{0.95} / \frac{0.08}{0.28} / \frac{1.11}{0.98}$	$\frac{0.86}{0.87} / \frac{0.09}{0.16} / \frac{0.53}{0.52}$	$\frac{0.86}{0.88} / \frac{0.09}{0.16} / \frac{0.55}{0.52}$	$\frac{0.90}{0.99} / \frac{0.08}{0.29} / \frac{0.49}{0.70}$	$\frac{0.86}{0.85} / \frac{0.09}{0.18} / \frac{0.60}{0.85}$	$\frac{1.04}{1.12} / \frac{0.07}{0.10} / \frac{0.61}{0.74}$	$\frac{0.94}{1.07} / \frac{0.06}{0.35} / \frac{0.48}{0.56}$	-
eETMDP	$\frac{1.14}{0.94} / \frac{0.47}{0.02} / \frac{0.58}{0.66}$	$\frac{1.09}{0.88} / \frac{0.61}{0.00} / \frac{0.80}{0.69}$	$\frac{1.08}{0.89} / \frac{0.61}{0.01} / \frac{0.80}{0.47}$	$\frac{1.19}{1.03} / \frac{0.81}{0.09} / \frac{0.48}{0.53}$	$\frac{1.12}{0.87} / \frac{0.57}{0.02} / \frac{0.88}{0.57}$	$\frac{1.26}{1.13} / \frac{0.68}{0.01} / \frac{0.90}{0.69}$	$\frac{1.18}{1.13} / \frac{0.62}{0.05} / \frac{0.51}{0.46}$	$\frac{1.27}{1.06} / \frac{0.62}{0.01} / \frac{0.58}{0.74}$

Table 9 Pairwise comparison of gap values ($\frac{A}{B}$) for relaxation algorithms in three groups

$\begin{smallmatrix} B \\ A \end{smallmatrix}$	MPCC	WDP	MDP	eMDP	TWDP	TMDP	eTMDP	ETMDP
WDP	$\frac{0.18}{0.28} / \frac{0.67}{0.71} / \frac{0.21}{0.22}$	-	-	-	-	-	-	-
MDP	$\frac{0.09}{0.27} / \frac{0.52}{0.59} / \frac{0.29}{0.22}$	$\frac{0.27}{0.31} / \frac{0.50}{0.50} / \frac{0.08}{0.31}$	-	-	-	-	-	-
eMDP	$\frac{0.48}{0.21} / \frac{0.77}{0.72} / \frac{0.33}{0.16}$	$\frac{0.53}{0.17} / \frac{0.74}{0.65} / \frac{0.22}{0.52}$	$\frac{0.51}{0.12} / \frac{0.57}{0.50} / \frac{0.33}{0.29}$	-	-	-	-	-
TWDP	$\frac{0.05}{0.31} / \frac{0.54}{0.59} / \frac{0.18}{0.31}$	$\frac{0.12}{0.25} / \frac{0.50}{0.49} / \frac{0.10}{0.41}$	$\frac{0.16}{0.32} / \frac{0.50}{0.50} / \frac{0.14}{0.31}$	$\frac{0.16}{0.64} / \frac{0.51}{0.57} / \frac{0.13}{0.40}$	-	-	-	-
TMDP	$\frac{0.14}{0.29} / \frac{0.50}{0.58} / \frac{0.20}{0.28}$	$\frac{0.33}{0.28} / \frac{0.48}{0.49} / \frac{0.09}{0.42}$	$\frac{0.25}{0.23} / \frac{0.48}{0.50} / \frac{0.14}{0.22}$	$\frac{0.17}{0.59} / \frac{0.48}{0.57} / \frac{0.18}{0.31}$	$\frac{0.37}{0.16} / \frac{0.47}{0.51} / \frac{0.09}{0.14}$	-	-	-
eTMDP	$\frac{0.69}{0.20} / \frac{0.61}{0.58} / \frac{0.23}{0.31}$	$\frac{0.62}{0.18} / \frac{0.61}{0.50} / \frac{0.22}{0.72}$	$\frac{0.70}{0.11} / \frac{0.60}{0.50} / \frac{0.28}{0.41}$	$\frac{0.40}{0.21} / \frac{0.57}{0.56} / \frac{0.13}{0.38}$	$\frac{0.83}{0.15} / \frac{0.61}{0.51} / \frac{0.28}{0.25}$	$\frac{0.63}{0.16} / \frac{0.60}{0.48} / \frac{0.21}{0.28}$	-	-
ETMDP	$\frac{0.06}{0.28} / \frac{0.49}{0.58} / \frac{0.18}{0.30}$	$\frac{0.27}{0.37} / \frac{0.47}{0.49} / \frac{0.08}{0.44}$	$\frac{0.17}{0.23} / \frac{0.47}{0.50} / \frac{0.11}{0.41}$	$\frac{0.18}{0.60} / \frac{0.46}{0.57} / \frac{0.11}{0.42}$	$\frac{0.22}{0.13} / \frac{0.46}{0.50} / \frac{0.16}{0.17}$	$\frac{0.13}{0.25} / \frac{0.46}{0.47} / \frac{0.12}{0.28}$	$\frac{0.14}{0.73} / \frac{0.47}{0.60} / \frac{0.30}{0.40}$	-
eETMDP	$\frac{0.46}{0.03} / \frac{0.77}{0.56} / \frac{0.46}{0.05}$	$\frac{0.47}{0.02} / \frac{0.90}{0.65} / \frac{0.43}{0.61}$	$\frac{0.58}{0.03} / \frac{0.75}{0.50} / \frac{0.58}{0.51}$	$\frac{0.33}{0.30} / \frac{0.91}{0.71} / \frac{0.36}{0.12}$	$\frac{0.61}{0.02} / \frac{0.77}{0.51} / \frac{0.63}{0.02}$	$\frac{0.54}{0.03} / \frac{0.76}{0.48} / \frac{0.56}{0.11}$	$\frac{0.30}{0.34} / \frac{0.76}{0.59} / \frac{0.58}{0.04}$	$\frac{0.66}{0.03} / \frac{0.76}{0.47} / \frac{0.64}{0.01}$