

Problem	Jacobian computation <sup>1</sup>			Newton step <sup>1</sup>		
N	\$	\$	\$	\$	\$	\$
	$\backslash \text{makecell}\{\text{AD}\}$	$\backslash \text{makecell}\{\text{ASD}\}$	$\backslash \text{makecell}\{\text{ASD}\}$	$\backslash \text{makecell}\{\text{take(AD)}\}$	$\backslash \text{makecell}\{\text{take(Jacobian)}\}$	
	$\backslash \backslash$	$\backslash \backslash$	$\backslash \backslash$	$\backslash \backslash$	$\backslash \backslash$	$\backslash \backslash$
	$\backslash \text{text}\{(\text{prepared})\}$	$\backslash \text{text}\{(\text{prepared})\}$	$\backslash \text{text}\{(\text{unprepared})\}$	$\backslash \text{text}\{(\text{iterative})\}$	$\backslash \text{text}\{(\text{iterative})\}$	$\backslash \text{text}\{(\text{direct})\}$
6	\$1.64	\$ (8.3)	\$3.36 (0.5)	\$	\$2.19	\$4.52
	$\cdot \mathbf{1.97}$		$\cdot$	$\mathbf{2.07}$	$\cdot$	$\cdot$
	$10^{-5}$	$\cdot$	$10^{-5}$	$\cdot$	$10^{-5}$	$10^{-5}$
	$10^{-6}$			$10^{-5}$		
12	\$2.44	\$ (28.1)	\$1.70 (1.4)	\$	\$1.61	\$2.42
	$\cdot \mathbf{8.67}$		$\cdot$	$\mathbf{1.34}$	$\cdot$	$\cdot$
	$10^{-4}$	$\cdot$	$10^{-4}$	$\cdot$	$10^{-4}$	$10^{-4}$
	$10^{-6}$			$10^{-4}$		
24	\$4.02	\$ (117.2)	\$1.31 (3.1)	\$	\$1.34	\$1.24
	$\cdot \mathbf{3.43}$		$\cdot$	$\mathbf{1.04}$	$\cdot$	$\cdot$
	$10^{-3}$	$\cdot$	$10^{-3}$	$\cdot$	$10^{-3}$	$10^{-3}$
	$10^{-5}$			$10^{-3}$		
48	\$7.60	\$ (451.4)	\$1.70 (4.5)	\$	\$1.17	\$8.98
	$\cdot \mathbf{1.68}$		$\cdot$	$\mathbf{8.34}$	$\cdot$	$\cdot$
	$10^{-2}$	$\cdot$	$10^{-2}$	$\cdot$	$10^{-2}$	$10^{-3}$
	$10^{-4}$			$10^{-3}$		
96	\$1.35	\$ (2017.2)	\$2.16 (6.2)	\$7.56	\$1.11	\$
	$\cdot \mathbf{6.68}$		$\cdot$	$\cdot$	$\cdot$	$\mathbf{4.07}$
	$10^0$	$\cdot$	$10^{-1}$	$10^{-2}$	$10^{-1}$	$\cdot$
	$10^{-4}$					$10^{-2}$
192	\$2.25	\$ (7293.5)	\$4.62 (4.9)	\$1.05	\$1.07	\$
	$\cdot \mathbf{3.09}$		$\cdot$	$\cdot$	$\cdot$	$\mathbf{2.30}$
	$10^1$	$\cdot$	$10^0$	$10^0$	$10^0$	$\cdot$
	$10^{-3}$					$10^{-1}$

<sup>1</sup>Wall time in seconds.

<sup>2</sup>In parentheses: Wall time ratio compared to prepared AD (higher is better).