The MATPOWER case format also allows for additional fields to be included in the structure. The OPF is designed to recognize fields named `A`, `l`, `u`, `H`, `Cw`, `N`, `fparm`, `z0`, `zl` and `zu` as parameters used to directly extend the OPF formulation as described in Section 7.1. Other user-defined fields may also be included, such as the `reserves` field used in the example code throughout Section 7.2. The `loadcase` function will automatically load any extra fields from a case file and, if the appropriate `'savecase'` callback function (see Section 7.2.5) is added via `add_userfcn`, `savecase` will also save them back to a case file.

Table B-1: Bus Data (`mpc.bus`)

name	column	description
`BUS_I`	1	bus number (positive integer)
`BUS_TYPE`	2	bus type (1 = PQ, 2 = PV, 3 = ref, 4 = isolated)
`PD`	3	real power demand (MW)
`QD`	4	reactive power demand (MVAr)
`GS`	5	shunt conductance (MW demanded at $V = 1.0$ p.u.)
`BS`	6	shunt susceptance (MVAr injected at $V = 1.0$ p.u.)
`BUS_AREA`	7	area number (positive integer)
`VM`	8	voltage magnitude (p.u.)
`VA`	9	voltage angle (degrees)
`BASE_KV`	10	base voltage (kV)
`ZONE`	11	loss zone (positive integer)
`VMAX`	12	maximum voltage magnitude (p.u.)
`VMIN`	13	minimum voltage magnitude (p.u.)
`LAM_P`†	14	Lagrange multiplier on real power mismatch (u/MW)
`LAM_Q`†	15	Lagrange multiplier on reactive power mismatch (u/MVAr)
`MU_VMAX`†	16	Kuhn-Tucker multiplier on upper voltage limit (u/p.u.)
`MU_VMIN`†	17	Kuhn-Tucker multiplier on lower voltage limit (u/p.u.)

† Included in OPF output, typically not included (or ignored) in input matrix. Here we assume the objective function has units u.

Table B-2: Generator Data (`mpc.gen`)

name	column	description
`GEN_BUS`	1	bus number
`PG`	2	real power output (MW)
`QG`	3	reactive power output (MVAr)
`QMAX`	4	maximum reactive power output (MVAr)
`QMIN`	5	minimum reactive power output (MVAr)
`VG`	6	voltage magnitude setpoint (p.u.)
`MBASE`	7	total MVA base of machine, defaults to `baseMVA`
`GEN_STATUS`	8	machine status, > 0 = machine in-service ≤ 0 = machine out-of-service
`PMAX`	9	maximum real power output (MW)
`PMIN`	10	minimum real power output (MW)
`PC1`*	11	lower real power output of PQ capability curve (MW)
`PC2`*	12	upper real power output of PQ capability curve (MW)
`QC1MIN`*	13	minimum reactive power output at `PC1` (MVAr)
`QC1MAX`*	14	maximum reactive power output at `PC1` (MVAr)
`QC2MIN`*	15	minimum reactive power output at `PC2` (MVAr)
`QC2MAX`*	16	maximum reactive power output at `PC2` (MVAr)
`RAMP_AGC`*	17	ramp rate for load following/AGC (MW/min)
`RAMP_10`*	18	ramp rate for 10 minute reserves (MW)
`RAMP_30`*	19	ramp rate for 30 minute reserves (MW)
`RAMP_Q`*	20	ramp rate for reactive power (2 sec timescale) (MVAr/min)
`APF`*	21	area participation factor
`MU_PMAX`†	22	Kuhn-Tucker multiplier on upper P_g limit (u/MW)
`MU_PMIN`†	23	Kuhn-Tucker multiplier on lower P_g limit (u/MW)
`MU_QMAX`†	24	Kuhn-Tucker multiplier on upper Q_g limit (u/MVAr)
`MU_QMIN`†	25	Kuhn-Tucker multiplier on lower Q_g limit (u/MVAr)

* Not included in version 1 case format.

† Included in OPF output, typically not included (or ignored) in input matrix. Here we assume the objective function has units u.

Table B-3: Branch Data (`mpc.branch`)

name	column	description
F_BUS	1	“from” bus number
T_BUS	2	“to” bus number
BR_R	3	resistance (p.u.)
BR_X	4	reactance (p.u.)
BR_B	5	total line charging susceptance (p.u.)
RATE_A	6	MVA rating A (long term rating)
RATE_B	7	MVA rating B (short term rating)
RATE_C	8	MVA rating C (emergency rating)
TAP	9	transformer off nominal turns ratio, (taps at “from” bus, impedance at “to” bus, i.e. if $r = x = 0$, $tap = \frac{\lvert V_f \rvert}{\lvert V_t \rvert}$)
SHIFT	10	transformer phase shift angle (degrees), positive $\Rightarrow$ delay
BR_STATUS	11	initial branch status, 1 = in-service, 0 = out-of-service
ANGMIN*	12	minimum angle difference, $\theta_f - \theta_t$ (degrees)
ANGMAX*	13	maximum angle difference, $\theta_f - \theta_t$ (degrees)
PF†	14	real power injected at “from” bus end (MW)
QF†	15	reactive power injected at “from” bus end (MVAr)
PT†	16	real power injected at “to” bus end (MW)
QT†	17	reactive power injected at “to” bus end (MVAr)
MU_SF‡	18	Kuhn-Tucker multiplier on MVA limit at “from” bus (u/MVA)
MU_ST‡	19	Kuhn-Tucker multiplier on MVA limit at “to” bus (u/MVA)
MU_ANGMIN‡	20	Kuhn-Tucker multiplier lower angle difference limit (u/degree)
MU_ANGMAX‡	21	Kuhn-Tucker multiplier upper angle difference limit (u/degree)

* Not included in version 1 case format. The voltage angle difference is taken to be unbounded below if ANGMIN < -360 and unbounded above if ANGMAX > 360. If both parameters are zero, the voltage angle difference is unconstrained.

† Included in power flow and OPF output, ignored on input.

‡ Included in OPF output, typically not included (or ignored) in input matrix. Here we assume the objective function has units u.