More detailed experimental procedures are shown in this document. The specific contents are as follows:

- Table 1 shows the network architecture and parameters of CGAN;
- Table 2 shows the network architecture and parameters of LBDSAC for IEEE-118 bus system.
- Table 3 shows the network architecture and parameters of LBDSAC for IEEE-300 bus system.
- Fig. 1 shows the training process of LBDSAC, that is, with the number of iterations, the value of reward, the value of cost, the loss of Actor network, the loss of CV-CN, the loss of RV-CN and the value of Entropy;
- Fig. 2 shows the loss of the Discriminator in CGAN.
- Fig. 3 shows the dispatch strategy based on LBDSAC for IEEE118 bus system.
- Fig. 4 shows the dispatch strategy based on LBDSAC for IEEE300 bus system.
- Fig. 5 shows the tensorflow graph of integral framework of LBDSAC for IEEE118 bus system.
- Fig. 6 shows the tensorflow graph of main network of LBDSAC for IEEE118 bus system.

TABLE I CGAN NETWORK ARCHITECTURE AND PARAMETERS

Layer	Network	Parameter	Configuration
Layer1	2D-Conv	Size of kernel	3×3
		Number of kernel	32
		Padding	(1,1,1,1)
		Stride	1
	Activation function	LeakyReLU	0.2
Layer2	2D-Conv	Size of kernel	3×3
		Number of kernel	64
		Padding	(1,1,1,1)
		Stride	1
	Activation function	LeakyReLU	0.2
Layer3	2D-Conv	Size of kernel	3×3
		Number of kernel	16
		Padding	(1,1,1,0)
		Stride	1
	Activation function	ReLU	-
Optimizer	RMSprop	Learning rate	2e-4
		alpha	0.9
Regularization	Weight clipping	Range	[-1, 1]

(a) Generator network

Layer	Network	Parameter	Configuration
Layer1	2D-Conv	Size of kernel	3×3
		Number of kernel	32
		Padding	(1,1,1,1)
		Stride	1
	Activation function	LeakyReLU	0.2
Layer2	2D-Conv	Size of kernel	3×3
		Number of kernel	64
		Padding	(1,1,1,1)
		Stride	1
	Activation function	LeakyReLU	0.2
Layer3	2D-Conv	Size of kernel	3×3
		Number of kernel	16
		Padding	(1,1,1,1)
		Stride	1
	Activation function	ReLU	-
Layer4	Linear	Number of neurons	(64, 1)
Optimizer	RMSprop	Learning rate	2e-4
		alpha	0.9

(b) Discriminator network

TABLE II LBDSAC NEURAL NETWORK ARCHITECTURE AND PARAMETERS FOR IEEE-118 SYSTEM

Variable scope	name	Parameter	Configuration
Main	Actor	Number of neurons	(113, 128, 256, 256, 64, 54(mu)) (113, 128, 256, 256, 64, 54(std))
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Critic_qr1	Number of neurons	(167, 128, 256, 64, 1)
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Critic_qr2	Number of neurons	(167, 128, 256, 64, 1)
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Critic_qc1	Number of neurons	(167, 128, 256, 64, 1)
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Critic_qc2	Number of neurons	(167, 128, 256, 64, 1)
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Replay buffer	Size of replay	24000
		Batch size	256
Target	Actor	Number of neurons	(113, 128, 256, 256, 64, 54(mu)) (113, 128, 256, 256, 64, 54(std))
		Soft update rate	0.995
	Critic_qr1	Number of neurons	(167, 128, 256, 64, 1)
		Soft update rate	0.995
	Critic_qr2	Number of neurons	(167, 128, 256, 64, 1)
		Soft update rate	0.995
	Critic_qc1	Number of neurons	(167, 128, 256, 64, 1)
		Soft update rate	0.995
	Critic_ qc1	Number of neurons	(167, 128, 256, 64, 1)
		Soft update rate	0.995
Entropy temperature	Soft α	Size of weight	1
		initializer	0
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
Cost weight	Soft λ	Size of weight	2
		initializer	0
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)

TABLE III LBDSAC NEURAL NETWORK ARCHITECTURE AND PARAMETERS FOR IEEE-300 SYSTEM

Variable scope	name	Parameter	Configuration
Main	Actor	Number of neurons	(149, 128, 256, 256, 64, 69(mu)) (149, 128, 256, 256, 64, 69(std))
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Critic_qr1	Number of neurons	(218, 128, 256, 64, 1)
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Critic_qr2	Number of neurons	(218, 128, 256, 64, 1)
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Critic_qc1	Number of neurons	(218, 128, 256, 64, 1)
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Critic_qc2	Number of neurons	(218, 128, 256, 64, 1)
		Activation function	ReLU
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
	Replay buffer	Size of replay	24000
		Batch size	256
Target	Actor	Number of neurons	(149, 128, 256, 256, 64, 69(mu)) (149, 128, 256, 256, 64, 69(std))
		Soft update rate	0.995
	Critic_qr1	Number of neurons	(218, 128, 256, 64, 1)
		Soft update rate	0.995
	Critic_qr2	Number of neurons	(218, 128, 256, 64, 1)
		Soft update rate	0.995
	Critic_qc1	Number of neurons	(218, 128, 256, 64, 1)
		Soft update rate	0.995
	Critic_ qc1	Number of neurons	(218, 128, 256, 64, 1)
		Soft update rate	0.995
Entropy temperature	Soft α	Size of weight	1
		initializer	0
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)
Cost weight	Soft λ	Size of weight	2
		initializer	0
		Optimizer	Adam
		Learning rate	1~4000 (1e-3), 4000~8000 (1e-4)

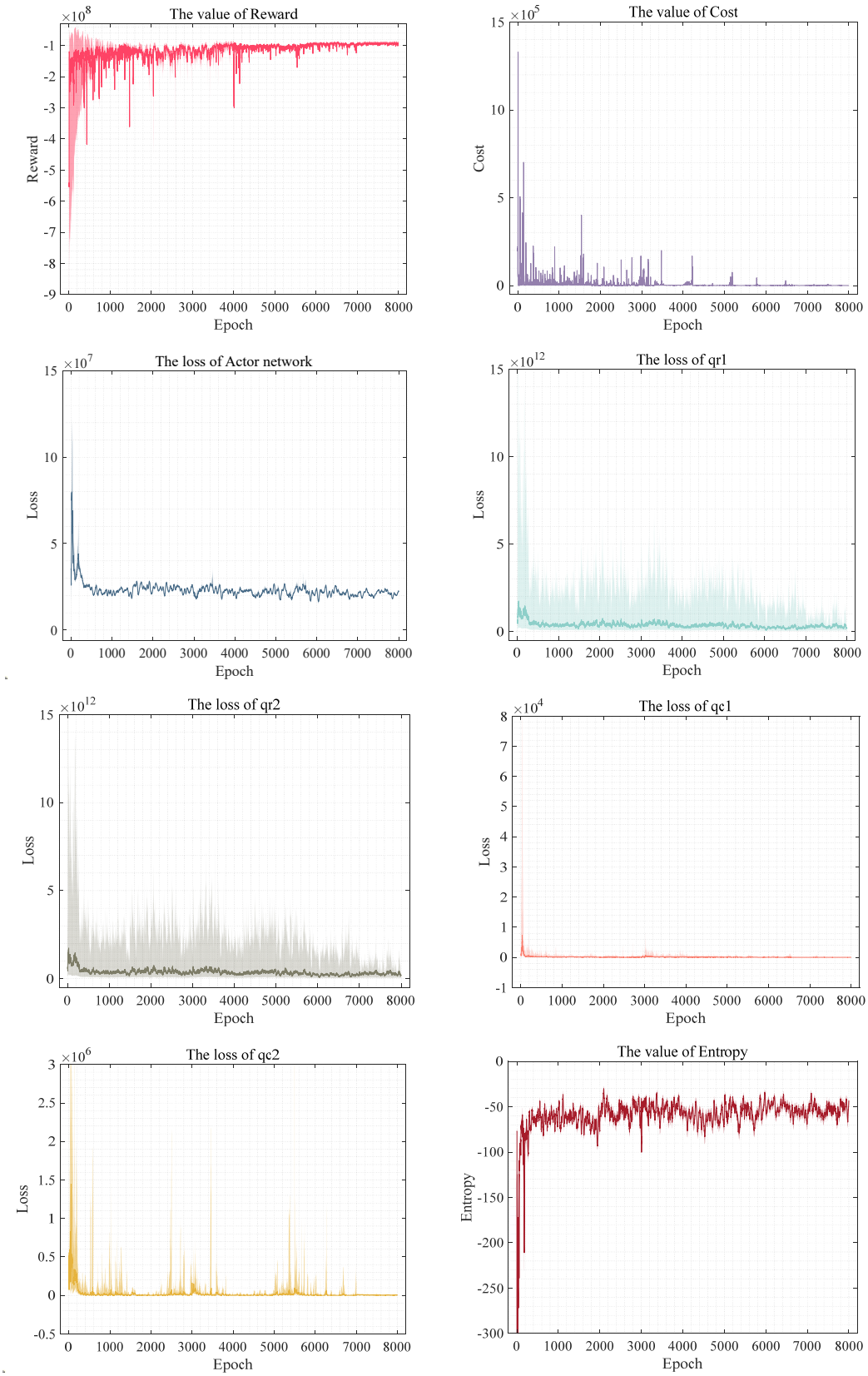

Fig. 1: The training process of LBDSAC based on IEEE118 bus system

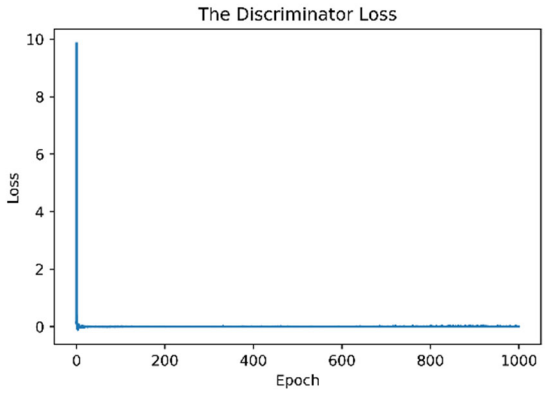

Fig. 2: The loss of Discriminator

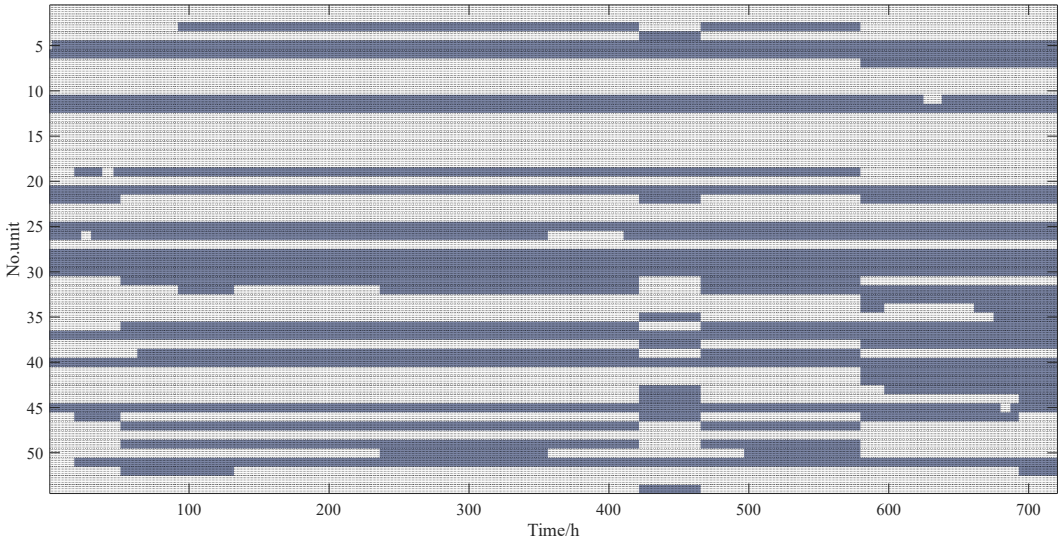

Fig. 3: Commitment decisions formulated by LBDSAC for IEEE118 bus system

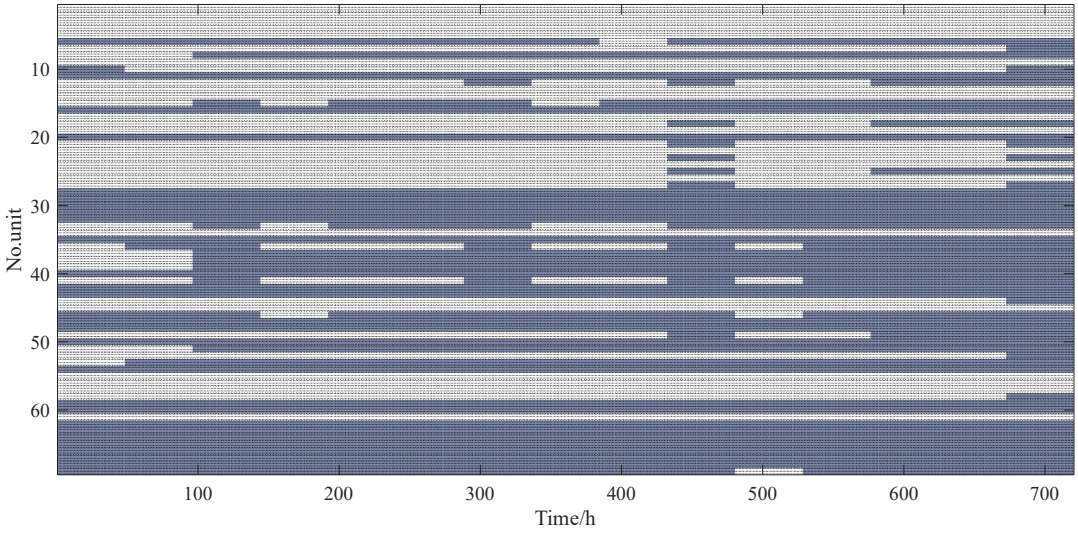

Fig. 4: Commitment decisions formulated by LBDSAC for IEEE300 bus system

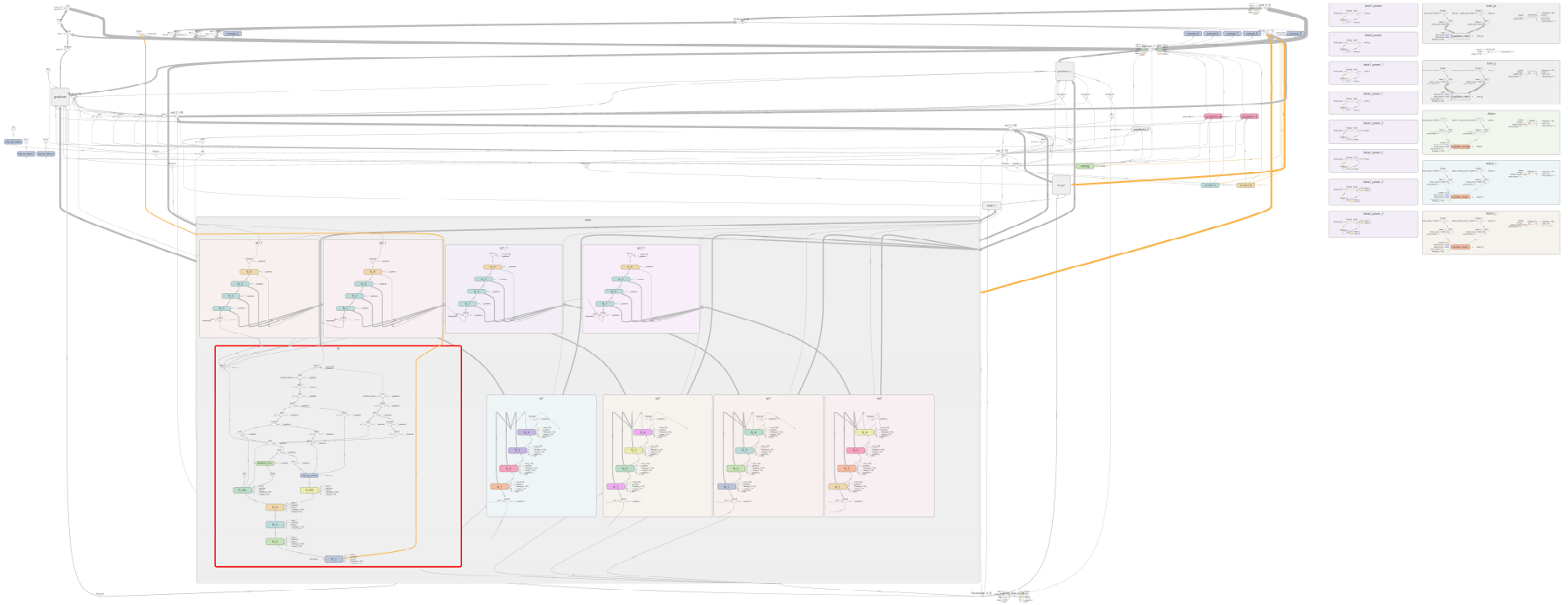

Fig. 5: The tensorflow graph of integral framework of LBDSAC for IEEE118 bus system

Fig. 6: The tensorflow graph of main network of LBDSAC for IEEE118 bus system