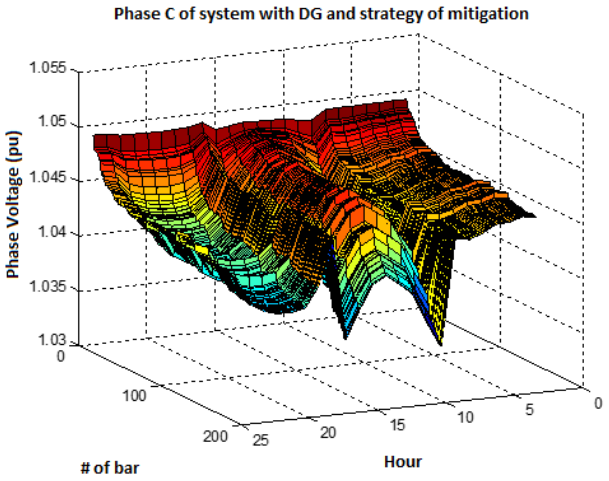

Fig. 9. Voltage time plot with strategy A

D. Voltage Regulators

The simulation was made considering the implementation of 3 voltage regulators along the grid, nearby regions with higher voltage rises. It was also an effective strategy to bring voltage levels under the legal limits as shown in Fig. 10.

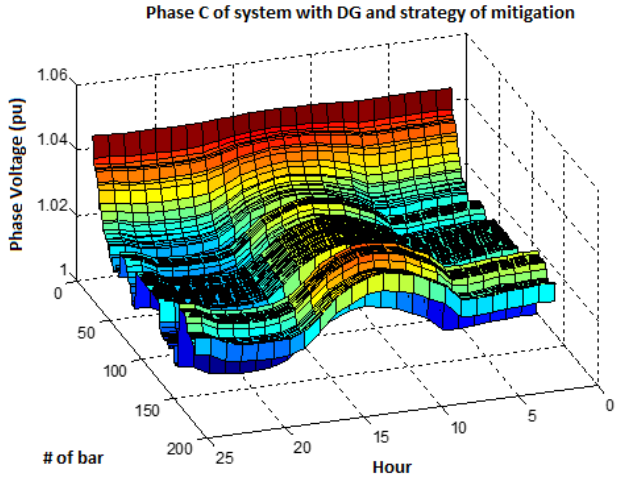

Fig. 10. Voltage time plot with strategy D

5. Conclusion

The four strategies simulated have shown themselves capable to work effectively reducing voltage rises caused by high concentration of DGs.

Therefore, it is possible to conclude that voltage levels are controllable to values compatible with the legislations. This control could be made with low effort strategies such as limiting power feeding or with more complex ones, such as reactive compensators with the same time plot as active power feeding.

All of these strategies that have been simulated were able to reduce voltage rises, but the active power flow is still going from DGs to substation in all of them. It means that DGs were still feeding the substation after solving voltage rise problem.

Technical and economic aspects should be considered choosing the most appropriate strategy for each circumstance. Limiting the active power feeding may harm customers in systems where high DG penetration is already real. Although, demanding reactive power from the customers may increase the costs of DG setting. Bigger compensators, set by energy companies together with another grid reinforcement costs could be dilute between costumers with DGs connections, making them more satisfied, since there are no individual requirements. Then, this choice should be made considering pros and cons, together with the opportunity cost of the deprecated options.

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