The problem

We saw that without using the DNN scores (Maria's variables) as input to the pDNN the significance in the VBF channel is always higher using the invariant mass instead of the score:

http://www.le.infn.it/~apalazzo/allow_listing/r33-24/significance.html

Could it be due to a lack of statistics in the VBF channel?

Train statistics

	Merged		Resolved	
	ggF	VBF	ggF	VBF
RSG	614275	116918	44287	6318
Radion	556924	202133	59070	16657
HVT	439919	87156	37409	4420
Background	~ 1524342	~ 35500	~ 2654482	~ 46452

The exact number of background events in a channel slightly varies for each signal due to the fact that the train set (signal + bkg) is randomly selected as a fixed fraction of the total (train + test) dataset

The test

We trained the pDNN in the ggF channel using the same number of raw signal and background events as in the VBF channel.

Results show that in this case the significance obtained using mass is worse than the one obtained using the invariant mass:
http://www.le.infn.it/~apalazzo/allow_listing/r33-24/significance_ggFsameStatAsVBF.html