Detailed explanation on the HFT cluster from [QUANT] Volatility

----

1) Introduction and concept :
2) BASIC HFT Alert formulas and definition
3) HFT Cluster formulas and definition
4) screenshot examples

----

1) Introduction and concept :

As you already know, with the [QUANTUM] Volatility tool, I tried to synthesize things, simplify things, while of course keeping the essentials, and while maintaining a high level of accuracy in the data and signals that are generated!

Even if this tool concentrates a multitude of different alerts, it is now easier to read! And this is thanks to the famous HFT clusters that gather the most relevant combinations of HFT signals that are triggered together on the same bar, or on several consecutive price bars.

As the number of HFT signals is important, their triggering can be untimely and high in frequency! As the number of HFT clusters is much smaller, and much more precise! Both in terms of timing, and in terms of potential price difference.

In this tool, and with the famous HFT cluster detector, I wanted to bring together the best of HFT signals, while maximizing, and optimizing their potential for success!

It has been a long term job, a long work! Months and months of work, which itself is based on years of research and experience!   Having said that, I have achieved something particularly successful with this HFT cluster detector! I think it's probably one of my best achievements! And all the more interesting since it is now totally integral to the Q algo!

The concepts used here always remain the same! It will be a question of being able to qualify the nature of the volumes entering and leaving the markets! but also of being able to measure with a high degree of accuracy, the way in which these market orders are executed! Both in terms of impact on prices, as well as speed, or impact on the order book and the order flow that will follow!

We will of course remain very focused on the different market making behaviors, and the way they will manage their position inventories!

More general concepts such as stop hunt and trapped volume will of course always be on the agenda! I think that's still the basis for price creation and formation! And this even if today all this is automated, and done at a very high frequency. Market making, in its fundamentals, remains fundamentally the same as it was 20 years ago! Everything just goes much faster!

----

2) Basic HFT Alert formulas and definition :
----

a) HFT CONVERGENCE :

---> HFT Buy Convergence : triggered when the DV is up, DUDTV is up, and price action is up

*FORMULAS : =AND(L > L[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

---> HFT Sell Convergence : triggered when the DV is down, DUDTV is down, and price action is down.

*FORMULAS : =AND(H < H[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

----

b) HFT DIVERGENCE :

---> HFT Buy Divergence : triggered when the DUDTV value is superior than the DV value, with price down.

*FORMULAS : =AND(C < C[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

---> HFT Sell Divergence : triggered when the DUDTV value is inferior than the DV value, with price up.

*FORMULAS : =AND(C > C[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

----

c) HFT MANIPULATION :

---> HFT Buy Manipulation : triggered when the DUDTV value is positive, and DV value is negative, with price down.

*FORMULAS : =AND(L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

---> HFT Sell Manipulation : triggered when the DUDTV value is negative, and DV value is position, with price up.

*FORMULAS : =AND(H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

----

d) GAP WITH MANIPULATION :

---> Gap Up With Manipulation : triggered when a price level has been gapped up (without quote) with a negative DV value printed on the next price level.

*FORMULAS : =AND(ID51.SG1 > TICKSIZE , ID53.SG4 <= 0 , ID16.SG2 > H , H > H[-1] , L > L[-1])

---> Gap Down With Manipulation : triggered when a price level has been gapped down (without quote) with a positive DV value printed on the next price level.

*FORMULAS : =AND(ID51.SG1 < -TICKSIZE , ID53.SG4 >= 0 , ID16.SG2 < L , H < H[-1] , L < L[-1])

----

e) MARKET MAKING CHANGE :

---> Market Making turn bullish : triggered when the CDUDTV value is crossing up the CDV value (calculated since the open).

*FORMULAS : =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0)

---> Market Making turn bearish : triggered when the CDUDTV value is crossing down the CDV value (calculated since the open).

*FORMULAS : =AND(ID29.SG1[-1] < 0 , ID29.SG1 > 0)

----

f) RSI OVERBOUGHT/OVERSOLD :

---> Oversold alert : triggered when the RSI is measured below 25

*FORMULAS : =AND(ID42.SG1 < 25 , H < H[-1] , L < L[-1])

---> Overbought alert : triggered when the RSI is measure above 75

*FORMULAS : =AND(ID42.SG1 > 75 , H > H[-1] , L > L[-1])

----

g) STOP LOSS HUNTING :

---> SL HUNT for Buy : huge amount of sell market orders filled very fast below a support

*FORMULAS : =AND(ID60.SG1 < TIME(0, 0, 1) , L < L[-1] , H < H[-1])

---> SL HUNT for Sell : huge amount of buy market orders filled very fast above a resistance

*FORMULAS : =AND(ID60.SG1 < TIME(0, 0, 1) , L > L[-1] , H > H[-1])

----

3) HFT Clusters Formulas and Definition :

a) VERTICAL HFT CLUSTERS :

(cluster 1)
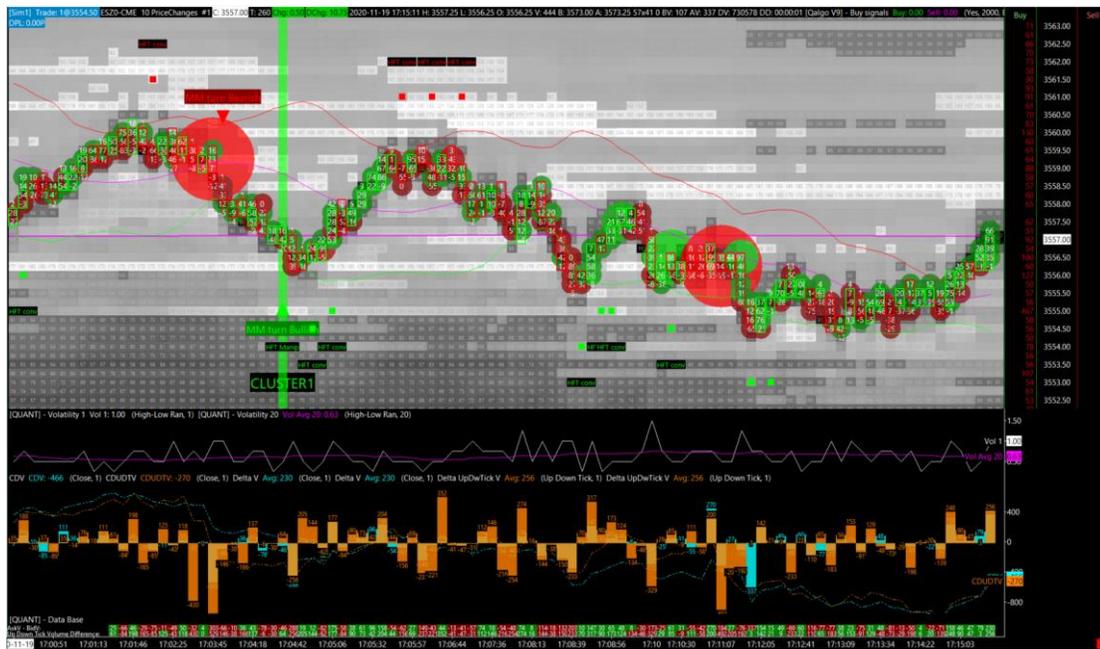
MM turn bullish + HFT manip =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0 , L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

MM turn bearish + HFT manip =AND(ID29.SG1[-1] < 0 , ID29.SG1 > 0 , H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)
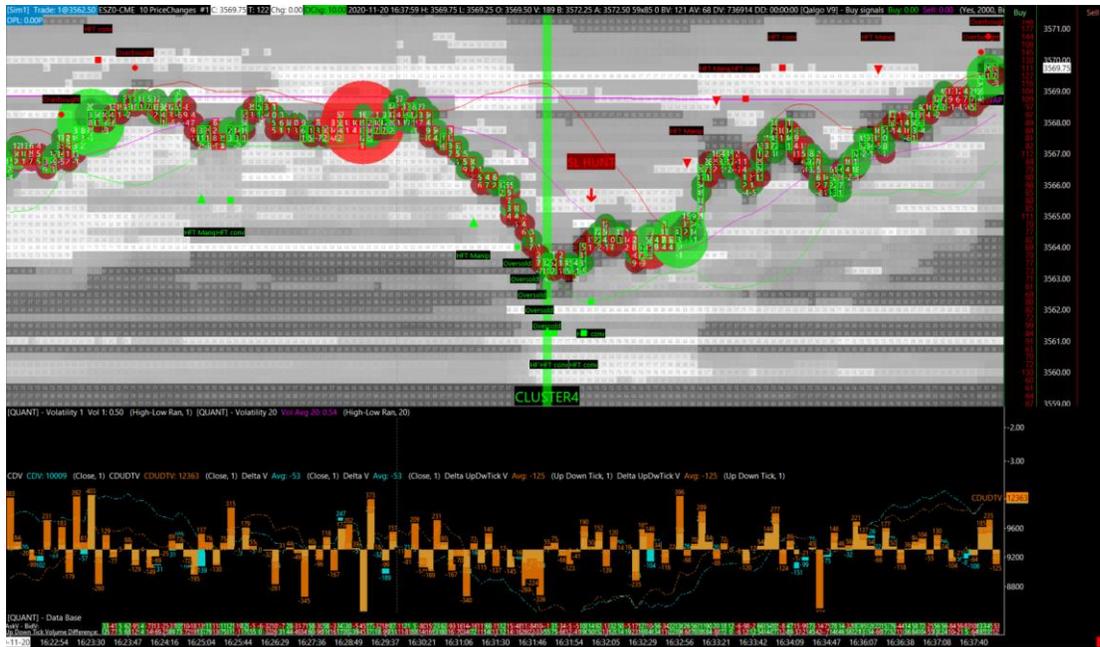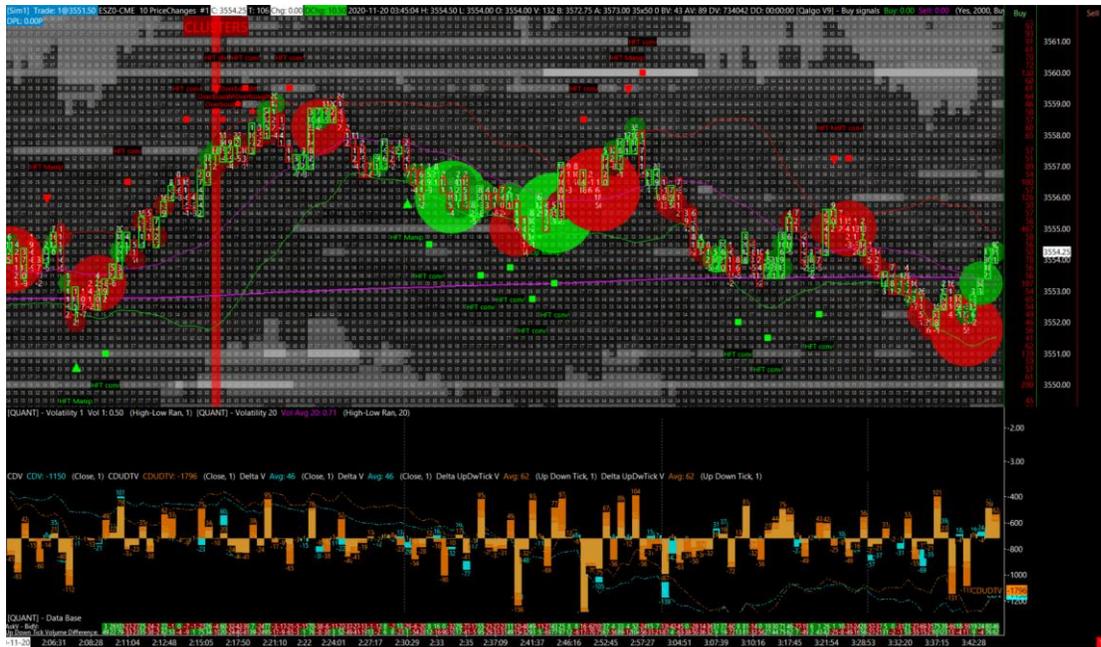
(cluster 2)
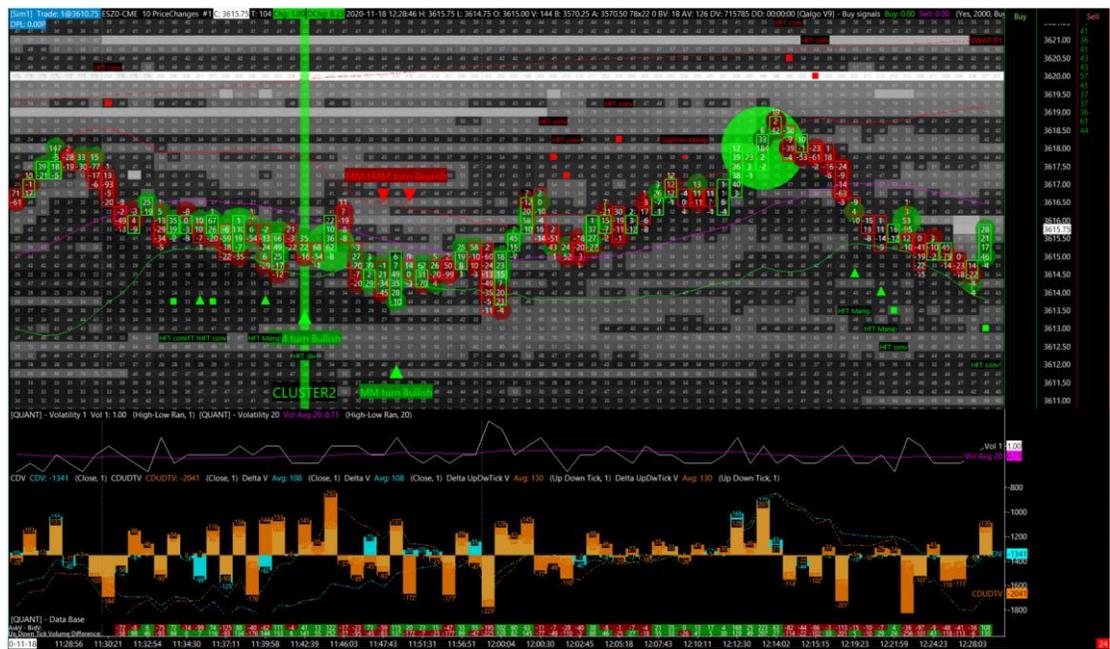
MM turn bullish + HFT div =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0 , C < C[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

MM Turn bearish + HFT div =AND(ID29.SG1[-1] < 0 , ID29.SG1 > 0 , C > C[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 3)

MM turn bullish + HFT conv =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0 , L > L[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

MM turn bearish + HFT conv =AND(ID29.SG1[-1] < 0 , ID29.SG1 > 0 , H < H[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 4)

HFT manip + oversold   =AND(L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

HFT manip + overbought =AND(H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L , ID42.SG1 > 75 , H > H[-1] , L > L[-1])

(cluster 5)

HFT Div + overbought =AND(C > C[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L , ID42.SG1 > 75 , H > H[-1] , L > L[-1])

HFT Div + oversold   =AND(C < C[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

(cluster 6)
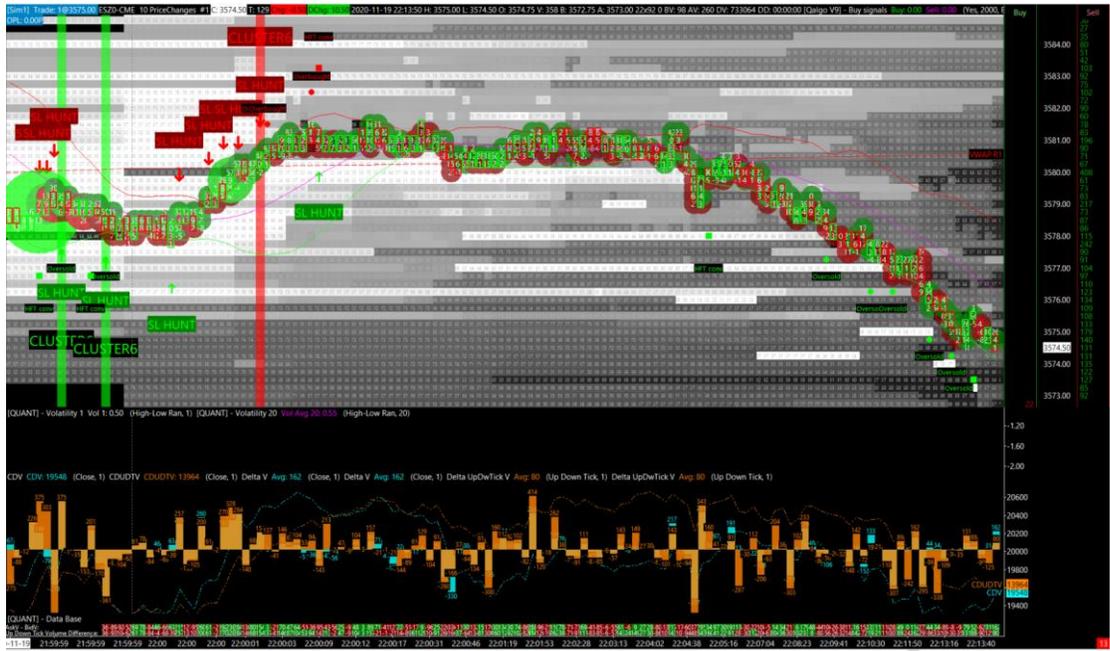
SL hunt + oversold   =AND(ID60.SG1 < TIME(0, 0, 1) , L < L[-1] , H < H[-1] , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

SL hunt + overbought =AND(ID60.SG1 < TIME(0, 0, 1) , L > L[-1] , H > H[-1] , ID42.SG1 > 75 , H > H[-1] , L > L[-1])

(cluster 7)

MM turn bullish + oversold   =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0 , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

MM turn bearish + overbought =AND(ID42.SG1 > 75 , H > H[-1] , L > L[-1] , ID29.SG1[-1] < 0 , ID29.SG1 > 0)

(cluster 8)
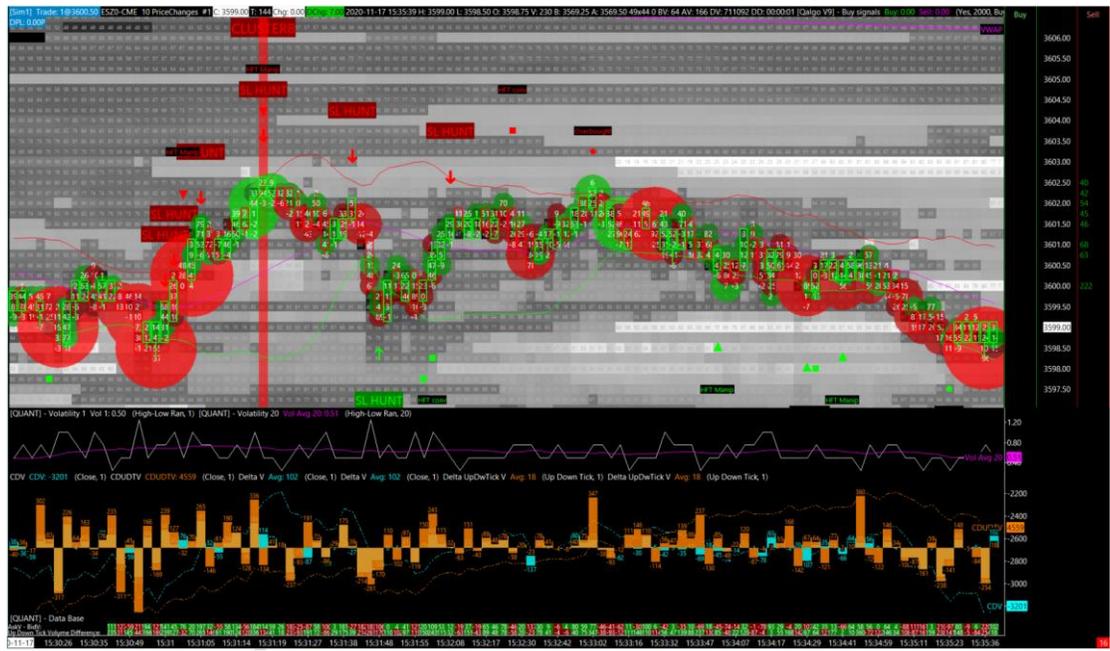
SL hunt + HFT B manip =AND(ID60.SG1 < TIME(0, 0, 1) , L < L[-1] , H < H[-1] , L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

SL hunt + HFT S manip =AND(ID60.SG1 < TIME(0, 0, 1) , L > L[-1] , H > H[-1] , H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 9)
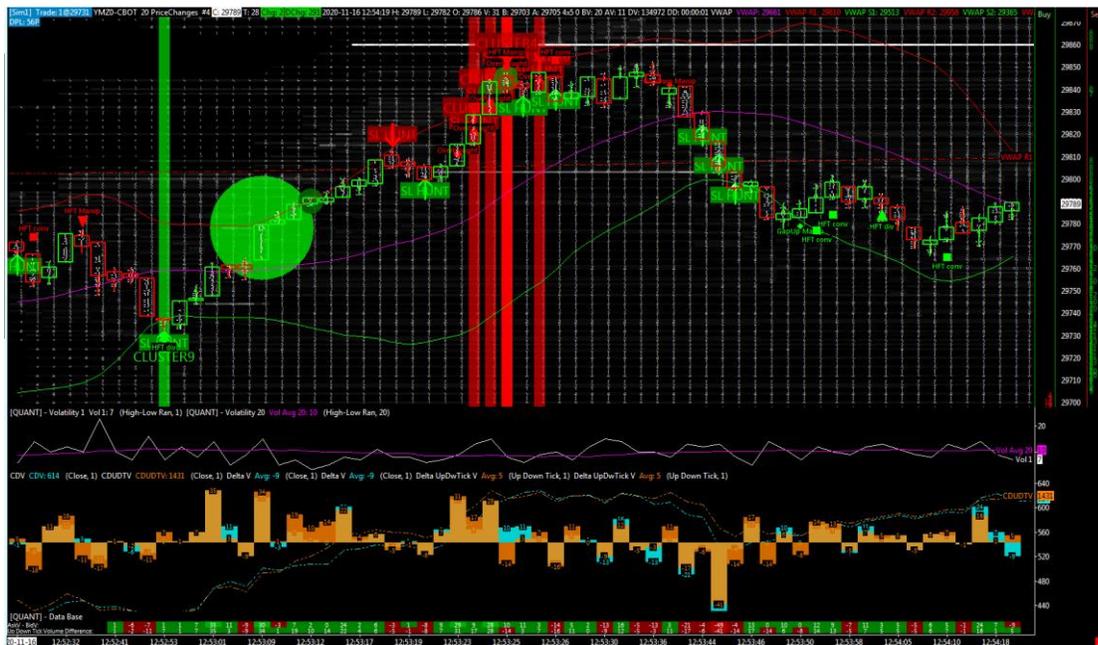
SL hunt + HFT B div =AND(ID60.SG1 < TIME(0, 0, 1) , L < L[-1] , H < H[-1] , C < C[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

SL hunt + HFT S div =AND(ID60.SG1 < TIME(0, 0, 1) , L > L[-1] , H > H[-1] , C > C[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 10)
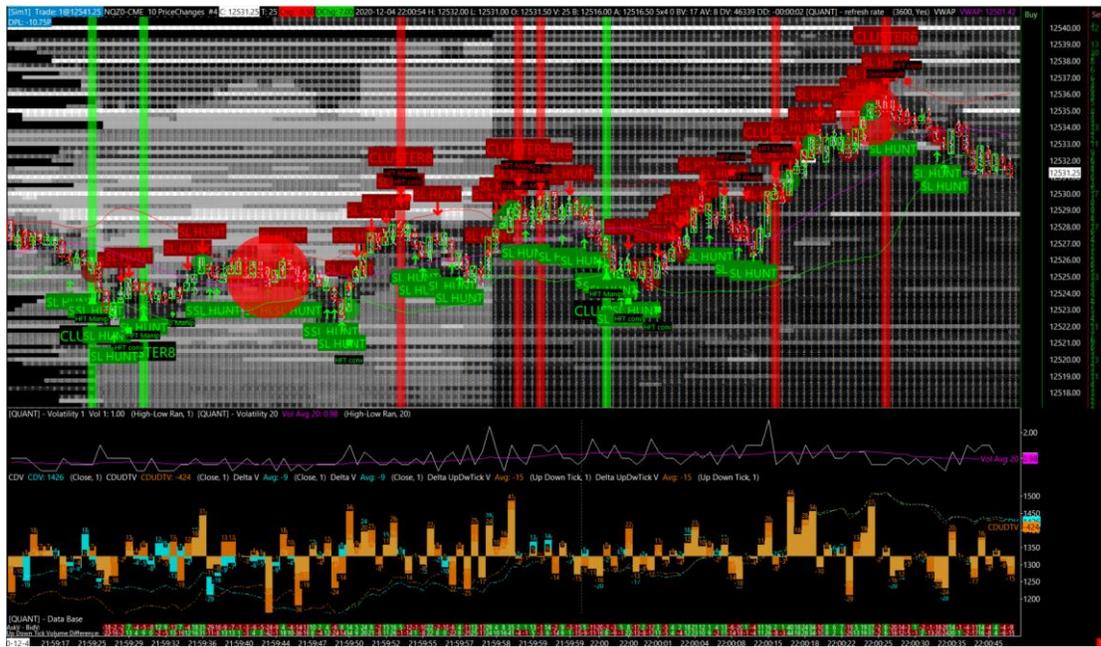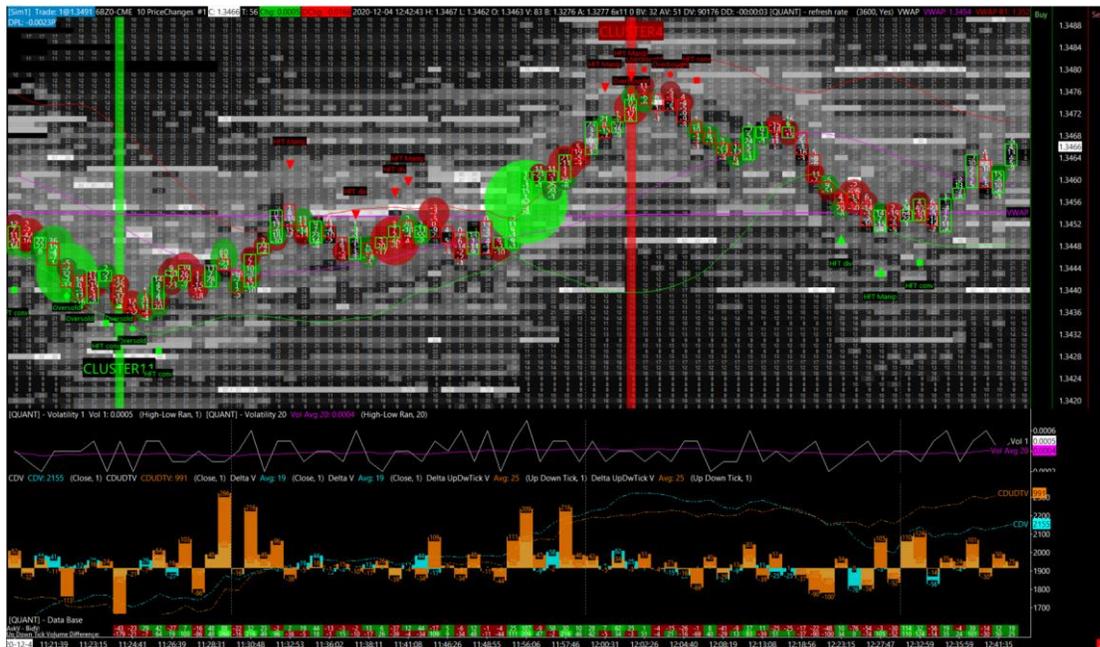
HFT Buy Conv + Oversold   =AND(L > L[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

HFT Sell Conv + Overbought =AND(H < H[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L , ID42.SG1 > 75 , H > H[-1] , L > L[-1])

b) HORIZONTAL HFT CLUSTERS :

(cluster 11)

---> here it is the HFT conv alert, which is followed by an oversold / overbought alert :) (consecutively triggeered price bar, after price bar)

(Oversold t0) + (HFT buy conv t-1)   =AND(ID42.SG1 < 25 , H < H[-1] , L < L[-1] , L[-1] > L[-2] , ID2.SG1[-1] > 0 , ID2.SG50[-1] > 0 , ID2.SG50[-1] > ID2.SG1[-1] , ID16.SG2[-1] > H[-1])

(Overbought t0) + (HFT sell conv t-1) =AND(ID42.SG1 > 75 , H > H[-1] , L > L[-1] , H[-1] < H[-2] , ID2.SG1[-1] < 0 , ID2.SG50[-1] < 0 , ID2.SG50[-1] < ID2.SG1[-1] , ID16.SG2[-1] < L[-1])

**(cluster 12)**
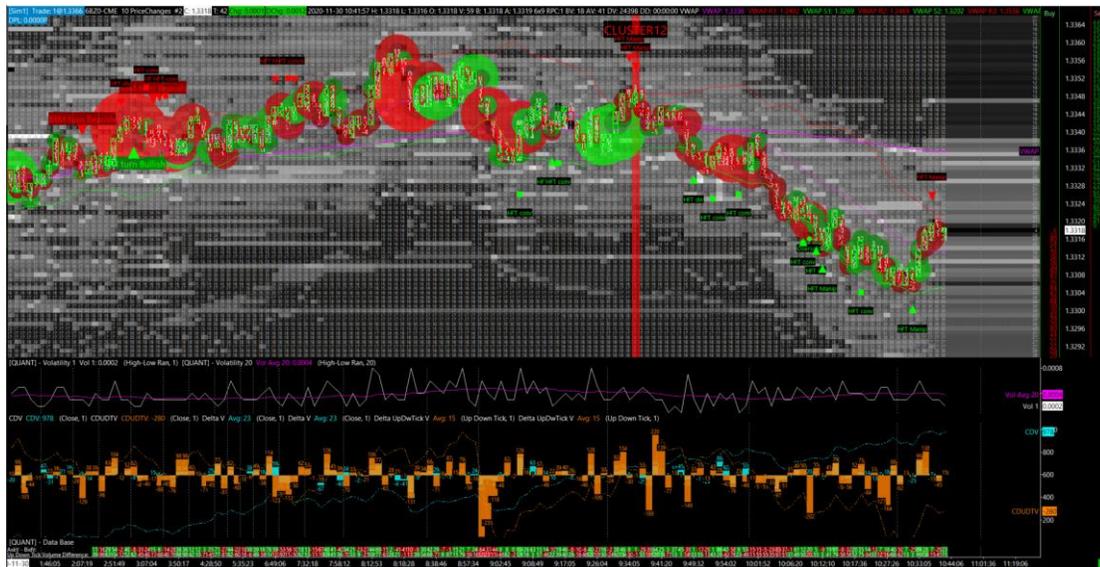
---> here it is HFT manip triggered x2 on two consecutive price bar (double HFT manip) ! it works well you will see :)

(HFT buy manip t-1) + (HFT buy Manip T0)   =AND(L[-1] < L[-2] , ID2.SG1[-1] < 0 , ID2.SG50[-1] > 0 , ID2.SG50[-1] > ID2.SG1[-1] , ID16.SG2[-1] > H[-1] , L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

(HFT Sell manip t-1) + (HFT sell manip T0) =AND(H[-1] > H[-2] , ID2.SG1[-1] > 0 , ID2.SG50[-1] < 0 , ID2.SG50[-1] < ID2.SG1[-1] , ID16.SG2[-1] < L[-1] , H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

**(cluster 13)**
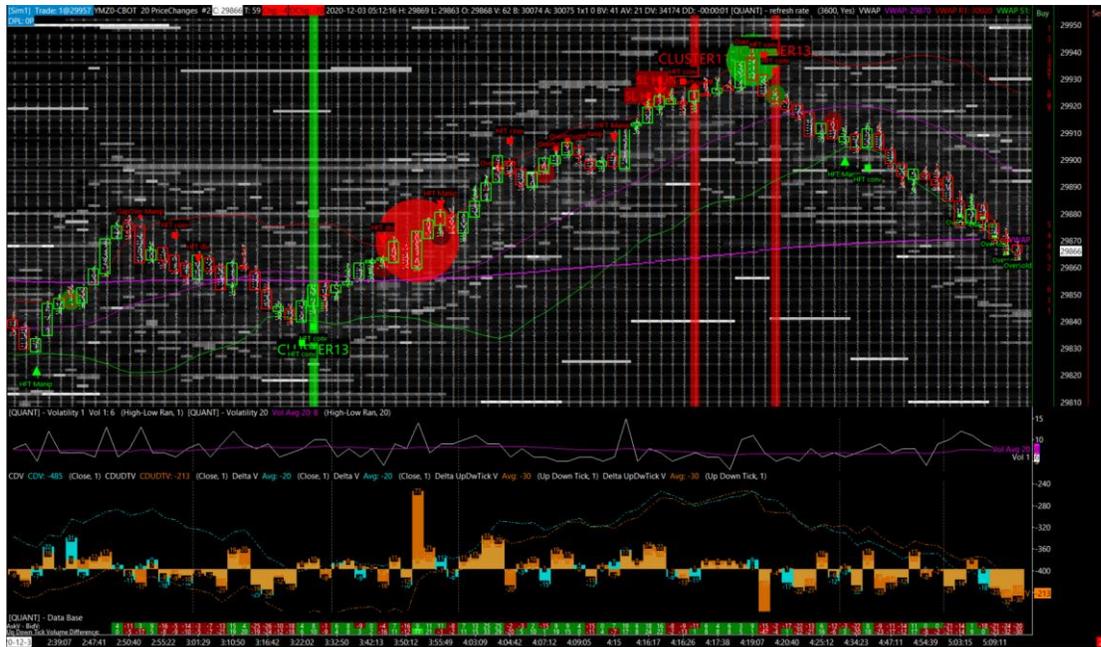
----> here it is the the double HFT conv :) one HFT buy conv triggered on one price bar, and a second HFT buy conv triggered on the next price bar.

(HFT buy conv t-1) + (HFT buy conv t0)   =AND(L[-1] > L[-2] , ID2.SG1[-1] > 0 , ID2.SG50[-1] > 0 , ID2.SG50[-1] > ID2.SG1[-1] , ID16.SG2[-1] > H[-1] , L > L[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

(HFT sell conv t-1) + (HFT sell conv t0) =AND(H[-1] < H[-2] , ID2.SG1[-1] < 0 , ID2.SG50[-1] < 0 , ID2.SG50[-1] < ID2.SG1[-1] , ID16.SG2[-1] < L[-1] , H < H[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 14)
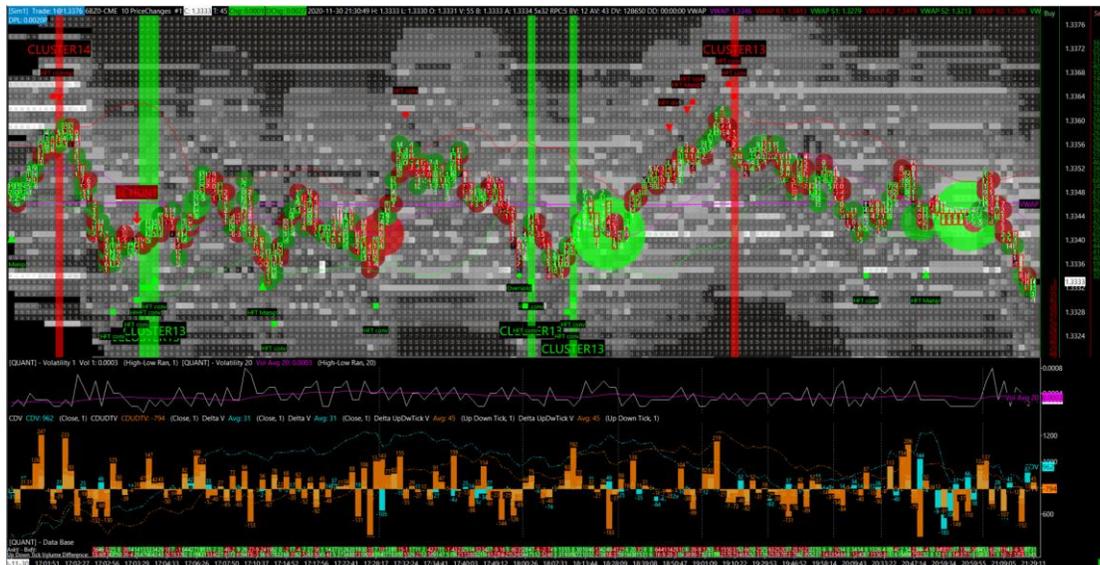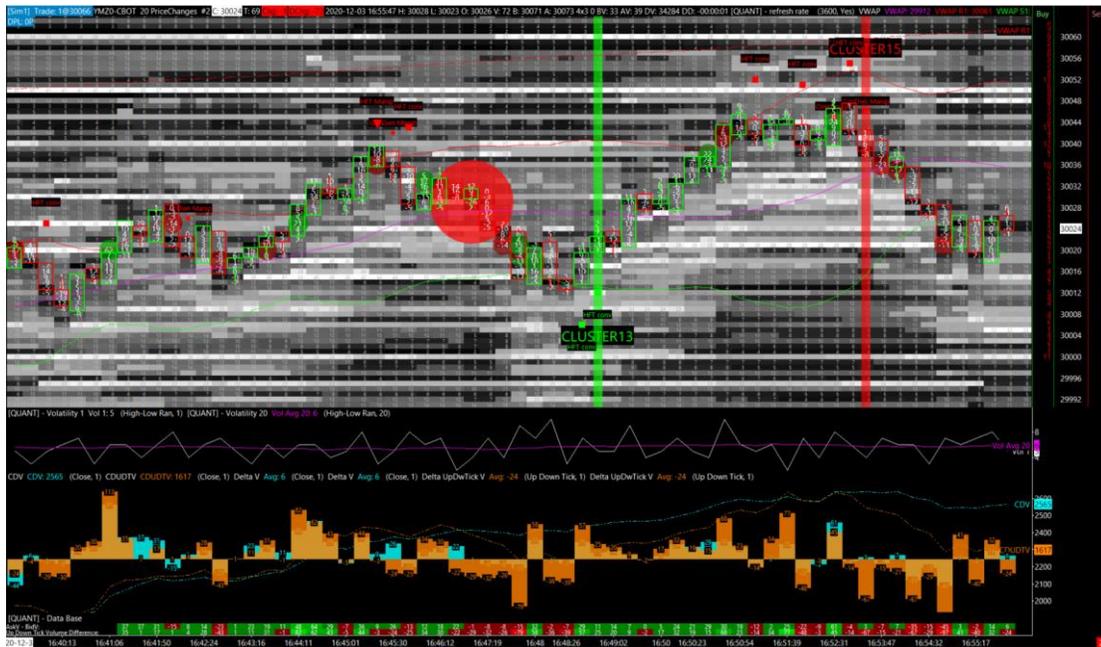
---> here we have the HFT conv which is triggered, and which is followed by an HFT manip alert ! (good combo too)

(HFT Buy Conv t-1) + (HFT buy manip T0)   =AND(L[-1] > L[-2] , ID2.SG1[-1] > 0 , ID2.SG50[-1] > 0 , ID2.SG50[-1] > ID2.SG1[-1] , ID16.SG2[-1] > H[-1] , L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

(HFT Sell Conv t-1) + (HFT Sell manip T0) =AND(H[-1] < H[-2] , ID2.SG1[-1] < 0 , ID2.SG50[-1] < 0 , ID2.SG50[-1] < ID2.SG1[-1] , ID16.SG2[-1] < L[-1] , H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 15)

---> here we have the HFT conv alert which is followed by the gap up/dw with manipulation alert (triggered on two consecutive price bar)

(HFT Buy conv t-1) + (Gap up manip t0)   =AND(L[-1] > L[-2] , ID2.SG1[-1] > 0 , ID2.SG50[-1] > 0 , ID2.SG50[-1] > ID2.SG1[-1] , ID16.SG2[-1] > H[-1] , ID51.SG1 > TICKSIZE , ID53.SG4 <= 0 , ID16.SG2 > H , H > H[-1] , L > L[-1])

(HFT Sell conv t-1) + (Gap down manip t0)   =AND(H[-1] < H[-2] , ID2.SG1[-1] < 0 , ID2.SG50[-1] < 0 , ID2.SG50[-1] < ID2.SG1[-1] , ID16.SG2[-1] < L[-1] , ID51.SG1 < -TICKSIZE , ID53.SG4 >= 0 , ID16.SG2 < L , H < H[-1] , L < L[-1])