CLAIMS

What is claimed is:

1. A system for use at a well, comprising:

a flowline through which well fluid flows from the well;

a virtual multiphase flowmeter disposed along the flowline, the virtual multiphase flowmeter having:

a flow restriction and at least one sensor proximate the flow restriction to obtain bulk flow data; and

a processor system receiving data from the at least one sensor, the processor system being configured to process the data to determine phase related information regarding the well fluid; and

a multiphase flowmeter through which the well fluid is periodically routed in series with the virtual multiphase flowmeter, the data from the multiphase flowmeter being processed by the processor system to calibrate and improve accuracy of the virtual multiphase flowmeter;

wherein the flow restriction serves as a choke to obtain the bulk flow data and the processor system processes the bulk flow data.

2. The system as recited in claim 1, wherein the flow restriction comprises a valve.

3. The system as recited in claim 1, wherein the flow restriction comprises a choke valve.

4. The system as recited in claim 1, wherein the at least one sensor comprises a plurality of pressure sensors positioned to measure a pressure drop across the flow restriction.

5. The system as recited in claim 4, wherein the at least one sensor further comprises a temperature sensor.

6. The system as recited in claim 1, further comprising a Christmas tree, wherein the flowline extends through the Christmas tree.

7. The system as recited in claim 6, wherein the flow restriction is downstream from the Christmas tree.

8. The system as recited in claim 1, further comprising additional sensors disposed along the flowline.

9. The system as recited in claim 8, wherein the additional sensors comprise a conductivity sensor.

10. The system as recited in claim 8, wherein the additional sensors comprise a pressure sensor.

11. The system as recited in claim 8, wherein the additional sensors comprise a temperature sensor.

12. A method, comprising:

producing a well fluid from a well;

routing the well fluid along a flowline and through a flow restriction;

monitoring parameters of the well fluid moving through the flow restriction to obtain data including bulk flow data; ~~and~~

processing the data to establish a virtual multiphase flowmeter by determining phases of the well fluid; and

periodically using a multiphase flowmeter along the flowline and in series with the virtual multiphase flowmeter to verify phases of the well fluid and to calibrate the virtual multiphase flowmeter;

wherein the flow restriction serves as a choke to obtain the bulk flow data and processing the data comprises processing the bulk flow data.

13. The method as recited in claim 12, wherein routing comprises routing the well fluid through a Christmas tree and then through the flow restriction.

14. The method as recited in claim 12, wherein monitoring comprises monitoring a pressure drop across the flow restriction.

15. The method as recited in claim 12, ~~further comprising periodically using a~~ wherein the multiphase flowmeter is periodically connected to ~~along~~ the flowline ~~to verify phases of the well fluid~~.

16. The method as recited in claim ~~15~~12, further comprising processing data from the multiphase flowmeter to improve accuracy with respect to processing the data from the flow restriction to thus improve accuracy of the virtual multiphase flowmeter.

17. The method as recited in claim 12, further comprising obtaining additional well fluid data from additional sensors positioned along the flow line.

18. A method, comprising:

producing a well fluid from a well;

routing the well fluid along a flowline and through a first flowmeter and a second flowmeter, the first flowmeter and the second flowmeter arranged in series, the second flowmeter operating according to a different physical principle than the first flowmeter; and

correlating data from the first flowmeter and the second flowmeter in a manner to determine salient flow physical properties of the well fluid;

wherein the first flowmeter is a virtual flowmeter and the second flowmeter is used periodically to calibrate and improve accuracy of the first multiphase flowmeter.

19. The method as recited in claim 18, wherein routing comprises routing the well fluid through the first flowmeter comprising a flow restriction and through the second flowmeter comprising a volumetric flowmeter.

20. The method as recited in claim 18, wherein routing comprises routing the well fluid through the first flowmeter comprising a flow restriction and through the second flowmeter comprising a mass flowmeter.