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said first pair of mirrors and a microwave amplifier directly connected to said receiving antenna.

7. A microwave spectrometer as in claim 6, wherein a microwave molecular beam is pulsed coaxially into said Fabry-Perot cavity through a pin hole in said one mirror of said first pair of mirrors. 5

8. A microwave spectrometer as in claim 1, wherein said first pair of mirrors forms a first Fabry-Perot cavity, said microwave spectrometer further comprising a second pair of mirrors positioned within said vacuum chamber, forming a second Fabry-Perot cavity. 10

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9. A microwave spectrometer as in claim 8, wherein said first Fabry-Perot cavity is pre-set to propagate a first fixed microwave frequency and said second Fabry-Perot cavity is pre-set to propagate a second fixed microwave frequency.

10. A microwave spectrometer as in claim 9, wherein a microwave molecular beam is pulsed coaxially into each of said first and second Fabry-Perot cavities through a pin hole in one mirror of the pair of mirrors which forms each cavity.

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