reflected, and, upon its return, is recorded using one or more receivers disposed on or above the subsurface region of the Earth. The seismic data recorded by the receivers may then be used to create an image or profile of the corresponding subsurface region.

[0005] Over time, as hydrocarbons are being extracted from the subsurface region of the Earth, the location, saturation, and other characteristics of the hydrocarbon reservoir within the subsurface region may change. As such, it may be useful to determine how the image or map of the subsurface region changes over time, such that the operations related to extracting the hydrocarbons may be modified to more efficiently extract the hydrocarbons from the subsurface region of the Earth.

SUMMARY

[0006] A summary of certain embodiments disclosed herein is set forth below. It should be understood that these aspects are presented merely to provide the reader with a brief summary of these certain embodiments and that these aspects are not intended to limit the scope of this disclosure. Indeed, this disclosure may encompass a variety of aspects that may not be set forth below.

[0006a] According to a first aspect of the present disclosure, there is provided a method, including: determining a residual associated with input seismic data, wherein the residual is indicative of a difference between an expected input seismic data and the input seismic data, wherein the expected input seismic data is determined by blending estimated primary signals with time shifts applied to the estimated primary signals based on a time of seismic source excitations that generated primary signals, and wherein a primary signal estimate is initialized; iteratively updating a value of the residual based at least in part on separation operations, wherein the separation operations are configured to filter coherent signals associated with residual data, or the sum of the residual data and with a current primary signal estimate, into a first subset of signals, and wherein the separation operations are configured to filter non-coherent signals associated with the residual data into a second subset of signals; generating additional coherent signals with correct timing from misplaced signals within the first subset of signals, at least in part by iteratively extracting and re-allocating a non-coherent part or a less-coherent part of the first subset of signals; in response to satisfying an end condition, transmitting a deblended output that is determined based at least in part on the first subset of signals and the additional coherent signals; and transmitting the deblended output for use in generating a seismic image, wherein the seismic image represents hydrocarbons in a subsurface region of Earth or subsurface drilling hazards**.**

[0006b] According to a second aspect of the present disclosure, there is provided a tangible, non-transitory, machine-readable media, including instructions configured to cause a processor to: determine a residual associated with input seismic data, wherein the residual is indicative of a difference between expected input seismic data and the input seismic data; determine a deblended output based at least in part on the residual; update the deblended output based at least in part on a result from performing one or more recovery operations configured to recover coherent signals from a less-coherent part of the deblended output, wherein the coherent signals comprise a matching parameter; and transmit the deblended output for use in generating a seismic image, wherein the seismic image represents hydrocarbons in a subsurface region of Earth or subsurface drilling hazards.

[0006c] According to a third aspect of the present disclosure, there is provided a device including: a first processor configured to: determine a residual associated with input seismic data, wherein the residual is indicative of a difference between expected input seismic data and the input seismic data; update a value of the residual based at least in part on a separation operation that separates coherent signals from noise signals in an output associated with the residual determined to be remaining energy for separation or a sum of the residual and a primary signal estimate; extract non-coherent or weak-coherent energy from the coherent signals; generate additional coherent signals with correct timing based at least in part on a re-allocation of the non-coherent or weak-coherent energy; in response to satisfying an end condition, determine a deblended output comprising the re-allocated non-coherent or weak-coherent energy from the output associated with misallocated energy in earlier separation operations; and transmit the deblended output for use in generating a seismic image, wherein the seismic image represents hydrocarbons in a subsurface region of Earth or subsurface drilling hazards.

[0007] Seismic acquisition utilizing sources and receivers may be useful in the generation of, for example, seismic images. Seismic images may be used, for example, in the determination of hydrocarbon deposits (e.g., areas within a subsurface that contain hydrocarbons) and/or subsurface drilling hazards. Seismic images are generally produced based on seismic waveforms produced by a source that reflect off regions within a subsurface and are received by receivers. The seismic image may be constructed using a high resolution seismic velocity model, such as full waveform inversion (FWI) model a tomography model or the like applied, for example, via a